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THE U.S. COAST GUARD

PREPARED AT THE REQUEST OF

HON. BOB PACKWOOD, *Chairman*

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

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LETTER OF TRANSMITTAL

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, D.C., March 18, 1982.

DEAR COLLEAGUE: Over the past decade, the Senate Committee on Commerce, Science, and Transportation has delegated more and more duties to the United States Coast Guard. In light of these expanded missions and continued budgetary constraints, it is important that the Senate have available for its consideration an objective, in-depth analysis of the history of the Coast Guard, its current goals and missions, and options for the future. We did request such a study, and after a year of thorough research, the Congressional Research Service has completed its work. It is published by the Committee for the benefit of the Senate at large.

Recently, the President established a Task Force on Drugs headed by Vice President Bush. The basic focus of this Task Force has been on curbing the illegal importation of drugs, primarily along the Gulf and Southeastern Coasts. The Coast Guard is playing a lead role in this effort, while maintaining its presence as the enforcer of the Fisheries Conservation and Management Act, and fulfilling its traditional and fundamental mission: search and rescue. With increased industrial, commercial, and recreational use of the coastline and inland waters, these responsibilities loom ever-larger for the Coast Guard.

As the Committee and the Senate move forward to review the role and missions of the Coast Guard, and the budgetary impact of improving the Coast Guard's physical plant, this study should prove to be an invaluable asset.

Cordially,

BOB PACKWOOD, *Chairman.*

LETTER OF SUBMITTAL

CONGRESSIONAL RESEARCH SERVICE,
THE LIBRARY OF CONGRESS,
Washington, D.C., February 23, 1982.

Hon. BOB PACKWOOD,
Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: Enclosed is our report on the U.S. Coast Guard prepared in response to your request dated December 8, 1980, and that of the Honorable Don Young, dated December 9, 1980. It is the product of a CRS interdivisional team comprised of Alva M. Bowen, coordinator, Eugene H. H. Buck, Harry L. Hogan, William H. Hymes, Frederick M. Kaiser, Martin R. Lee, Sharon Masanz, Robert E. Morrison, Kent M. Ronhovde, and John Stocker.

Noting the Coast Guard's expanding responsibilities at a time when government is imposing budgetary restraint, this study is intended to provide the kind of background needed for the Congress to address a number of important issues. We hope the report will serve the needs of the Congress.

Sincerely,

GILBERT GUDE, *Director.*

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PART I.—INTRODUCTION

BACKGROUND, PURPOSE, AND SCOPE

Initiatives by the President and the Congress in the last 10 years have expanded the responsibilities of the U.S. Coast Guard for environmental protection, fishery conservation and management, the interdiction of drug smuggling and illegal immigration, and marine safety. Although there has been some growth in the Coast Guard budget during this time, Coast Guard fiscal resources have not increased as fast as workload and there has been rising concern in Congress and elsewhere that the overload created by this situation curtails the ability of the Coast Guard to meet its responsibilities, new and old. This report compares recent Coast Guard performance to established standards and criteria to document shortcomings already evident.

The report also examines the Coast Guard's estimates of resources needed to overcome the deficiencies they recognize and opposing views as to the accuracy of the estimates and the need for the remedial actions they propose. Proposals to reduce or reassign some of the Coast Guard's responsibilities are also explored.

Central to the question of the adequacy of the Coast Guard's resources is the validity of the requirements the Coast Guard recognizes and seeks to meet. The main body of the report focuses on the Coast Guard's operating program plans, which document the agency's perception of these requirements and the resources needed to meet them.

To place the issues in historical perspective, the remainder of this introduction provides a brief history of the Coast Guard. Part II is a description of the Coast Guard's requirements-setting process. Part III is our analysis of the agency's operating program plans. Part IV examines Coast Guard cross-program planning and integration. Part V summarizes the issues raised in parts III and IV.

BRIEF HISTORY OF THE UNITED STATES COAST GUARD*

Since 1967, the United States Coast Guard (USCG) has been part of the Department of Transportation (DOT), but throughout most of its history it was in the Department of the Treasury. During certain times of emergency, however, the President placed it temporarily under the supervision of the Department of the Navy. Officially established in 1915 as a merger of the Revenue-Cutter Service and the Life-Saving Service, the USCG can trace its origin to the earliest period under the Constitution. This section reviews that history and identifies major organizational developments affecting the Coast Guard.[1]

Revenue Marine and Revenue Cutter Service

ORIGIN

Some sources cite 1789, others 1790, as the origin of the Treasury Department's Revenue Marine Service, which was a forerunner of the USCG.[2] Part of the reason for the difference is the absence of an express statutory or official departmental designation of a "Revenue Marine Service" or a "Revenue Cutter Service" during this formative period.[3] Another factor contributing to different dates of

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* Prepared by Frederick M. Kaiser, specialist in American National Government, Government Division.

[1] Among the numerous sources, from the Coast Guard itself as well as outside analysts, are: Bloomfield, Howard V. L. "The Compact History of the United States Coast Guard." New York, Hawthorn Books, Inc., 1966; Bragaw, Louis K. "Managing a Federal Agency: The Hidden Stimulus." Baltimore, the Johns Hopkins University Press, 1980; Capron, Capt. Walter C. "The U.S. Coast Guard." New York, Franklin Watts, Inc., 1965; Davis, Grant M. "The Department of Transportation." Lexington, Mass., Heath Lexington Books, 1970; Evans, Stephen H. (captain) "The United States Coast Guard, 1790–1915; A Definitive History (With a Postscript: 1915–1949)." Annapolis, Md., the United States Naval Institute, 1949; Smith, Darrell Hevenor, and Fred Wilbur Powell. "The Coast Guard: Its History, Activities and Organization." Washington, the Brookings Institution, 1929; U.S. Congress. Senate. Select Committee to Investigate the Executive Agencies of the Government. Investigation of the Executive Agencies of the Government (Preliminary report to the select committee from the Brookings Institution). Senate Report No. 1275, 75th Congress, 1st session. Washington, U.S. Government Printing Office, 1937. (Hereafter referred to as Senate Select Committee, 1937 report); U.S. President's Commission on Economy and Efficiency in the Government Service. "Message of the President Transmitting Reports of the Commission on Economy and Efficiency." House Document No. 670, 62d Congress, 2d session. Washington, U.S. Government Printing Office, 1912 (hereafter referred to, as it was commonly known, as the Taft Commission, 1912 report); and two works officially prepared by the U.S. Coast Guard: U.S. Department of the Treasury. U.S. Coast Guard. "Functions, Duties and Organization of the United States Coast Guard." Washington, U.S. Government Printing Office, 1917; and "U.S. Coast Guard: A Study of Its Origin, Responsibilities, Relationships, and Direction." Washington, U.S. Government Printing Office, 1963.

[2] Official USCG sources cite the latter 1790 date, as does Capt. Stephen Evans' history. Citations in footnote 1, supra. On the other hand, Smith and Powell's detailed study, "The Coast Guard," p. 1, recognizes the earlier ancestry and the Senate Select Committee 1937 report, p. 822, baldly states: "The Revenue Cutter Service was established in 1789 to assist in the collection of customs and tonnage duties."

[3] Initially the Revenue Cutter Service did not have an official statutory designation, a condition unchanged until 1863 when an act of Congress identified the "United States Revenue-Cutter Service" (12 Stat. 639). It had been referred to by that name by the Secretary of the Treasury as early as 1832, but alternatively was called the "Revenue Marine," the "Revenue Service," the "Revenue-Marine Service," and the "system of cutters" in official documents. Smith and Powell, "The Coast Guard," p. 1.

origination appears to be a disagreement over what constitutes the actual establishment of such an undesignated service: Express statutory provision of equipment versus statutory authority for a "parent" department to conduct a relevant activity or operation.

In 1789, several enactments of the first Congress provided authority for the regulation of foreign commerce and recognized the need for a marine police service as a part of the national fiscal organization. The most important of these laws with respect to the Coast Guard's origins was "An Act to regulate the Collection of the Duties imposed by law on the tonnage of ships or vessels, and on goods, wares and merchandise imported into the United States," approved July 31, 1789 (1 Stat. 29). Section 5 provided for the duties of a surveyor at each port, part of which included "the employment of boats which may be provided for securing the collection of the revenue * * *" (1 Stat. 37). This enactment also created a Customs Service, which supervised the early operations of the Revenue Marine and Revenue Cutter Service, and was followed by the formal establishment of the "Department of Treasury," as originally titled in an act of September 2, 1789 (1 Stat. 65).

On April 22, 1790, Secretary of the Treasury Alexander Hamilton, responding to an order of the House of Representatives, filed a report on the "Operations of the Act Laying Duties on Imports," the act of July 31, 1789. Hamilton's report specifically commented on the deficiencies in section 5 of that enactment, namely, the absence of any express provision authorizing boats:

> SECTION 5. This section comtemplates a provision of boats, for securing the collection of the revenue; but no authority to provide them is any where given. Information, from several quarters, proves the necessity of having them; nor can they, in the opinion of the Secretary, fail to contribute, in a material degree, to the security of the revenue, much more than will compensate for the expense of the establishment; the utility of which will increase in proportion as the public exigencies may require an augmentation of the duties. An objection has been made to the measure, as betraying an improper distrust of the merchants; but, that objection can have no weight, when it is considered that it would be equally applicable to all the precautions comprehended in the existing system; all which proceed on a supposition, too well founded to be doubted, that there are persons concerned in trade, in every country, who will, if they can, evade the public duties for their private benefit. Justice to the body of the merchants of the United States demands an acknowledgment that they have, very generally, manifested a disposition to conform to the national laws, which does them honor, and authorizes confidence in their probity. But every considerate member of that body knows that this confidence admits of exceptions, and that it is essentially the interest of the greater number that every possible guard should be set on the fraudulent few, which does not, in fact, tend to the embarrassment of trade.[4]

Hamilton then requested 10 boats, with the "first cost of one of these boats, completely equipped * * * computed at one thousand dollars" and a combined annual operating and maintenance expense of $18,560.[5]

Hamilton's request as Secretary of the Treasury was a pragmatic interpretation of a position he had authored in the Federalist Papers several years earlier. In Federalist No. 12, Hamilton argued that a nationally centralized customs-importation administration would also protect against smuggling, a continuing and costly disruption to legitimate trade and commerce, and that "a few armed

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[4] American State Papers. Washington, Gales & Seaton, 1832. Finance, v. 1, p. 47.
[5] Ibid.

vessels, judiciously stationed at the entrance of our ports, might at a small expense be made useful sentinels of the laws * * *."

Congress concurred with the essence of the Secretary's request and, on August 4, 1790, approved "An Act to provide more effectually for the collection of the duties imposed by law on goods, wares and merchandise imported into the United States, and on the tonnage of ships or vessels" (1 Stat. 145). Section 62 (1 Stat. 175) provided:

> That the President of the United States be empowered to cause to be built and equipped, so many boats or cutters, not exceeding ten, as may be necessary to be employed for the protection of the revenue, the expense whereof shall not exceed ten thousand dollars, which shall be paid out of the product of the duties on goods, wares and merchandise, imported into the United States, and on the tonnage of ships or vessels.

However, the compensation rates for officers and crews were at a somewhat lower rate than Hamilton recommended. Moreover, in another departure, section 64 provided that the officers should be "deemed officers of the customs" (1 Stat. 175), rather than commissioned officers in a proposed Navy.

According to one account, "since there was no naval establishment at that time, the Treasury Department was the logical and convenient place in which to place the new Service * * *."[6] Another explanation suggests a different interpretation: Its placement in Treasury indicated that its primary duty was to serve as "part of the national fiscal organization,"[7] rather than the fact that there was simply no competitive organization in which to house it or that the Service should serve as a surrogate "Navy" in national defense matters.

RELATIONSHIP WITH THE U.S. NAVY

The original authority charged the new Revenue Cutter Service with only one duty: That is, assistance in the enforcement of payment of customs and tonnage duties. A change in statutory authority was necessary for its expansion into the multimission responsibilities which have become its hallmark. One of the most important developments affected its national defense and naval responsibilities. When war with France threatened in 1797 and there was yet no standing Navy, Congress authorized the use of the revenue cutters, at the direction of the President, "to defend the sea coast, and to repel any hostility to their vessels and commerce, within their jurisdiction, having due regard to the duty of the said cutters, in the protection of the revenue." (1 Stat. 523, 525) This enactment—an act providing a naval armament, passed July 1, 1797 (1 Stat. 525)—also empowered the President to "increase the strength of the several revenue cutters * * *."

This provision was modified 1 year later, after a Navy Department had been created, in the following way:

> That the President of the United States . . . is hereby authorized, when he shall think fit to increase the strength of any revenue cutter, for the purpose of defence, against hostilities near the sea coast, to employ on board the same, at his discretion,

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[6] Smith and Powell, "the Coast Guard," p. 3.

[7] Millspaugh, Arthur. "Crime Control by the National Government." Washington, Brookings Institution, 1937, p. 65.

not exceeding seventy marines and seamen: any thing in the act, intituled "An act providing a naval armament," to the contrary hereof, notwithstanding. (1 Stat. 569)

In early 1799, the foundations for the present alternative-service responsibility for the USCG—that is, serving usually as a civilian agency but, in time of national emergency, serving under the direction of the U.S. Navy—were effected. On February 25, 1799 (1 Stat. 621), Congress provided:

That the President of the United States . . . is hereby authorized to place on the naval establishment, and employ accordingly, all or any of the vessels, which as revenue cutters, have been increased in force, and employed in the defense of the seacoast, pursuant to the act, intitled "An act providing a naval armament"; and thereupon, the officers and crews of such vessels, may be allowed, at the discretion of the President of the United States, the pay, subsistence, advantages and compensations, proportionably to the rates of such vessels, and shall be governed by the rules and discipline, which are, or which shall be established for the navy of the United States.

Less than 1 week later, on March 2, 1799 (1 Stat. 627, 699), the following proviso was added:

Provided, That the said revenue cutters shall, whenever the President of the United States shall so direct, cooperate with the navy of the United States, during which time, they shall be under the direction of the Secretary of the Navy, and the expenses thereof shall be defrayed by the agents of the Navy Department.

Even prior to this authority, in October 1798, the President already had directed that the revenue cutters should be under the disposal of the Secretary of the Navy, where they remained for 2 years, "constituting a part of the force assembled in preparation for possible hostilities against the French and being used in the suppression of piracy in the Caribbean." [8]

Based upon this heritage and the later statutory authority, revenue cutters were engaged in active war service during the War of 1812, the Seminole War of 1836, the Mexican War of 1846, the Paraguay expedition of 1852, the Civil War, and the Spanish-American War, as well as the U.S. military conflicts of the 20th century, by which time (1915) the U.S. Coast Guard had been officially established.[9] (Further discussion of Coast Guard involvement is presented in section C entitled the "U.S. Coast Guard.")

EXPANSION OF DUTIES, RESPONSIBILITIES, AND MISSIONS

In addition to the Revenue Cutter Service's original authority—assistance in the enforcement of payment of customs and tonnage duties—and its service to the Navy, other duties and responsibilities were assigned to it through the years, further broadening the foundation for its multimission capability and service orientation. Major statutory directives that either expressly or implicitly added to the Service's responsibilities from 1799 through 1915 include the following:

Additional duties involved with the collection and security of revenues, as directed by the Secretary of the Treasury (1 Stat. 627, 699, Mar. 2, 1799);
Aid in administering quarantine regulations and laws (1 Stat. 619, Feb. 25, 1799);
Assistance in suppressing the slave trade (3 Stat. 532, Mar. 3, 1819);
Enforcement of neutrality laws (3 Stat. 447, 449; Apr. 20, 1818);

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[8] Smith and Powell, "The Coast Guard," p. 6.
[9] Ibid.; Bragaw, "Managing a Federal Agency," p. 258; Evans, "The U.S. Coast Guard," pp. 50 and 160–167; and Bloomfield, "The Compact History of the U.S. Coast Guard," passim.

Suppression of piracy (3 Stat. 510, Mar. 3, 1819; and 12 Stat. 314, 315, Aug. 5, 1861);
Protection of timber reserves (3 Stat. 651, Feb. 23, 1822);
Assistance to vessels in distress (5 Stat. 208, Dec. 22, 1837, and 34 Stat. 190, May 12, 1906);
Enforcement of immigration laws (12 Stat. 340, 341, Feb. 19, 1862);
Certain police powers in Alaska (15 Stat. 240, 241, July 27, 1868; 25 Stat. 1009, Mar. 2, 1889; 30 Stat. 226, Dec. 29, 1897; 32 Stat. 327, 328, June 7, 1902; 34 Stat. 263, 264, June 14, 1906; and 37 Stat. 499, 501, Aug. 24, 1912);
Cooperation with the Bureau of Fisheries (23 Stat. 478, 494, Mar. 3, 1885; 34 Stat. 313, 314, June 20, 1906; and 38 Stat. 387, June 24, 1914);
Enforcement of navigation regulations (25 Stat. 157, May 16, 1888);
Special marine police services (29 Stat. 122, May 19, 1869; 35 Stat. 69, Apr. 28, 1908; and 36 Stat. 462, 463, June 9, 1910); and
Life saving operations (5 Stat. 208, Dec. 22, 1837; and 9 Stat. 321, 322, Aug. 14, 1848), about which further discussion follows in the section dealing with the Life Saving Service.[10]

Beyond these statutory directives, the Revenue Cutter Service expanded its activities, operations, and missions administratively, reacting to exigencies or special conditions. Special cruises and expeditions included searches for lost whalers off the Alaskan coast and certain ethnological and environmental studies during the late 1800's.[11] Even more dramatically, the sinking of the *Titanic* on April 16, 1912, after colliding with an iceberg, demonstrated the urgent need for a system of patrol and warning against such dangers in the North Atlantic. Two Navy cruisers were detailed in the immediate aftermath of the tragedy, but the Revenue Cutter Service assumed the duty in 1913, when no Navy ships were available. Later, it operated for this purpose under the convention of the International Conference on Safety at Sea, which provided for the establishment and maintenance of an international ice observation, ice patrol, and derelict service. The United States was requested by the Convention to manage the service, the expenses of which were to be borne, at varying rates, by the 13 interested maritime nations. Since that arrangement could not be implemented for 1 year, however, the United States was asked to undertake the patrol during the first half of 1914. The ice patrol was continued thereafter, except for a hiatus during United States involvement in World War I.[12]

ADMINISTRATIVE DEVELOPMENTS

Important statutory and departmental developments affected the administrative and control structure of the Revenue Marine, as well as its organizational characteristics, training, pay, allowances, retirement system, and terms of personnel enlistment.

According to Smith and Powell's history, "decentralization was the rule through all the early years of the Service. It was not until 1843 that the revenue cutters were made subject to control from Washington."[13] The reasons given for the initial decentralization were the designation of cutter officers as "officers of the customs" by the 1790 Organic Act and the placement of the cutters in June

[10] Further detail and description of the broad categories is found in Smith and Powell, "The Coast Guard," pp. 3-23, and in the Taft Commission, 1912 report, pp. 285-297.
[11] Smith and Powell, "The Coast Guard," pp. 16-17.
[12] Ibid., pp. 17-18; and Capron, "The U.S. Coast Guard," pp. 89-97.
[13] Smith and Powell, "The Coast Guard," p. 19. See also Evans, "The United States Coast Guard," p. 27.

1791, under the immediate supervision and direction of the local collectors of customs, who "were subject to little administrative control from Washington."[14] Louis Bragaw offers a later date—1801—for the beginning of decentralization, citing the earlier central control exerted by Treasury Secretary Hamilton and his Federalist successors (1789–1801), in contrast to Thomas Jefferson's Presidency and its emphasis on decentralization.[15]

Whichever time inaugurated the decentralized system that came to epitomize the Service during the early 1800's, the centrifugal forces had a firm foundation in the origins of the Service, given its location. That situation was changed in 1843, when the Secretary of the Treasury established a Revenue Marine Bureau in his office and selected Alex V. Fraser, a veteran captain in the Service, to head the operation. Among other innovations, Fraser removed control of purchasing for the revenue cutters from the collectors and transferred it to central headquarters, rotated officers from station to station, and required monthly inspections of each vessel's journals.[16] The result of these changes, according to Secretary Spencer's 1844 report to the Congress, was that "order and system" had been established in the Service. Furthermore, he asserted that other benefits ensued:

> In the establishment of a bureau having charge of this branch of public service, great reform has been produced in the expenditure as well as discipline of the Service, the result of which will be to lessen very materially the expenditure of each vessel as well as to insure a faithful discharge of the duties.[17]

Although the transformation was a purely administrative one, Congress had prodded such a move. A report in 1842 from the House Committee on Public Expenditures was especially harsh in its criticism of the Revenue Service, its operations and expenditures, and the absence of direct congressional control over those funds, undoubtedly contributing to the reorganization itself as well as to the Secretary's emphasis on "reform * * * in expenditure":

> There is another source of great and extravagant expenditure, which, in the opinion of the committee, might properly be retrenched. It is the revenue cutter service. This is a naval force springing up amongst us, controlled by the Secretary of the Treasury, accountable to no one but him, extended at will by him, supported by him out of the revenue before it gets into the Treasury, and may cost the country whatever he shall direct. He appropriates and pays, without the sanction of Congress, and even without its knowledge. The country knows nothing of the expenditure, unless called for by either House. The collectors of the ports pay the expenses of this Treasury navy, and the Secretary of the Treasury approves or rejects the expenditures. The crews, ships, and boats, are subject to their order, for pleasure, interest, or public service. The professed object is to aid in the collection of the revenue; but, as our revenues have decreased, the expenses of these cutters have increased.[18]

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[14] Smith and Powell, "The Coast Guard," p. 19.

[15] Bragaw, "Managing a Federal Agency," p. 255, is supported by Leonard White's well-regarded study of administrative history under the U.S. Constitution. White for instance, concluded that "the most extensive forms of central direction and control of the field services developed in the Treasury" under Hamilton. White, Leonard D., "The Federalists: A Study in Administrative History." New York, Macmillan, 1948, p. 202.

[16] Smith and Powell, "The Coast Guard," pp. 19–20; Evans, "The U.S. Coast Guard," pp. 34–37; and Leonard D. White, "The Jacksonians: A Study in Administrative History, 1829–1861." New York, Macmillan Co., 1954, pp. 537–538.

[17] U.S. Secretary of the Treasury. Annual report, 1844. House Document 45, 28th Congress, 1st session Washington, 1844, p. 1.

[18] U.S. Congress. House. Committee on Public Expenditures. "Reduction of Expenses of Federal Government; Report." House Report No. 756, 27th Congress, 2d session Washington, 1842, p.6.

The committee's criticism of expenditures increasing while revenues were decreasing did not take into account the multimission characteristic of the Revenue Marine. As noted above, by 1840, cutters were no longer confined to tonnage and customs duty collection. New maritime safety duties, winter cruises, and participation in the Seminole Indian War would have escalated expenditures without producing revenues. Moreover, a severe business depression in the 1830's and the repeal or lowering of tonnage and certain other duties reduced available revenues.[19]

The system of centralized authority generated in 1843, however, was comparatively short lived. By the end of the decade, control of the cutters reverted to the local collectors of the customs, due to an act of Congress (9 Stat. 395, 396; May 3, 1849) that created the office of Commissioner of Customs and disbanded the Revenue Marine Bureau.[20]

Strengthened central control rose again, following the Civil War period. In 1869, Treasury Secretary Boutwell appointed two commissions; one was directed to examine personnel matters and the other to review the various types of vessels available to the Revenue Marine. As a result of the former's recommendations, some officers were discharged and "those who were approved were assigned to duty and given rank according to their merits."[21] Thereafter, appointments were based on professional examination. The second commission, although ostensibly to focus on vessels, about which it developed certain recommendations, also emphasized the need for centralized administration:

> In order to secure the successful operation of this system . . . it is essentially important that the Service should be conducted under stringent regulations, from which the highest authority alone can authorize any departure.[22]

This recommendation gave rise to the establishment of a Revenue-Marine Division in the Secretary's office. The Chief, Sumner Kimball, who was appointed on February 1, 1871, promulgated several new regulations. These provided for selecting and promoting personnel based upon merit, centrally authorizing expenditures, requiring reports and inventories from those in charge of cutters, submitting logs and accounts to headquarters, inspecting cutters, and prohibiting the use of cutters for other than Government business.[23] On March 3, 1875, Congress granted statutory recognition to the new Division (18 Stat. 371, 396) and 1 year later authorized entrance by competitive examination and made the first provision for the appointment, training, and probationary period for cadets and their eventual promotion as officers (19 Stat. 102, 107). In 1877, a school of instruction was open in New Bedford, followed by a series of experimental training programs in different locations. Finally in 1910, its present location in New London was affirmed, where, in 1914, it was titled the "Revenue-Cutter Academy."

In 1894 (28 Stat. 162, 171), Congress had renamed the Revenue-Marine to be the Division of Revenue-Cutter Service and had entrusted the chiefship to a uniformed officer, a captain of the Serv-

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[19] Evans, "The U.S. Coast Guard," p. 35.
[20] Smith and Powell, "The Coast Guard," p. 20.
[21] U.S. Secretary of the Treasury. Annual report, 1872. Washington, 1872, p. xiv.
[22] U.S. Congress. Senate. Executive Document No. 93, 41st Congress, 2d session, p. 9.
[23] Smith and Powell, "The Coast Guard," p. 21.

ice. It was not until 1908 (35 Stat. 317, 322) that the President was authorized to appoint, subject to Senate confirmation, a captain commandant from among the line captains to serve as Chief of the Division, who was to serve for a renewable term of 4 years.

ATTEMPTED TAKEOVER BY THE NAVY IN PEACETIME

Periodically, the Revenue-Marine and Revenue-Cutter Service were threatened with takeover by the Navy. As historian Leonard White summarized it: "The Treasury had possession, the Navy coveted ownership." [24] During the early 1840's and again in the 1880's, the Navy tried to gain control of the Service. In the earlier episode, the Senate Commerce Committee, although disenchanted with the decentralized system of the Service, argued that a "sound policy requires that the Revenue Service and the Naval Service should be kept distinct." [25]

In the 1880's, Secretary of the Navy Chandler saw the Service as a place to employ Annapolis graduates, who were too numerous to be absorbed into the Navy. Revenue Marine Chief Ezra Clark categorically rejected the overture, declaring that the functions of the two were not comparable and arguing that the Revenue Marine Service was, in essence, "a national constabulary rather than a naval force" and that "the people have always jealously guarded the civil functions from the encroachments of the military power * * *." Chief Clark's indignation with the proposed transfer surfaced in his questioning of the motive behind it—"to build up an aristocracy of naval officers"—and in his charges against "the system of favoritism that has prevailed" in the Navy, the "superlative neglect" that allowed the Navy to dwindle in size "to its present state of degeneracy and ruin," the smuggling practices of naval officers and their "scandalous infractions of law," and the Navy's "extravagance in management." [26] Although the 1883 proposal was defeated, it was renewed only 6 years later. In 1889, conditions had changed appreciably. A majority of the Revenue-Marine officers endorsed the transfer, as did the House and Senate Committees on Commerce, following the approval of the Secretary of the Navy and the Secretary of the Treasury, the latter reversing the position of his predecessors. Despite this support and passage by the House, the measure failed to gain approval in the Senate.[27] The effort was again revived in 1892 but without success, "in spite of the fact that opinion seemed to be so strongly in favor of the consolidation of the two services both inside and outside of the Halls of Congress." [28]

LIFE-SAVING SERVICE

Beginning in the United States as a voluntary, private enterprise, lifesaving operations received their first legislative authoriza-

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[24] White, Leonard D. "The Republican Era: 1869-1901." New York, Macmillan Co., 1958, p. 115.

[25] Senate Commerce Committee report, Feb. 19, 1843, cited in Taft Commission, 1912 report, p. 325.

[26] In Taft Commission, 1912 report, statement by Navy Secretary Chandler, pp. 305-325; statement by Revenue Marine Chief Clark, pp. 325-336, with his direct quotations on pp. 329, 330, 332, 334, and 336.

[27] Ibid., p. 342.

[28] Ibid., p. 349.

tion in a statute approved December 22, 1837 (5 Stat. 208). This limited authorization empowered "the President * * * to cause any suitable number of public vessels * * * to cruise upon the coast in the severe portion of the season and to afford such aid to distressed navigators as their circumstances and necessities may require * * *." No assistance from the shore was provided, although "such service had already been rendered by lightkeepers and its extension was soon to be proposed."[29] It was not until 1847, however, that specific language—in the lighthouse appropriations for fiscal year 1848 (Mar. 3, 1847; 9 Stat. 175, 176)—called for "furnishing the lighthouses on the Atlantic coast with means of rendering assistance to shipwrecked mariners" and a sum of $5,000 was so appropriated. Additional amounts were applied the next year, and a captain of the Revenue-Marine Service was designated to act for the Treasury Department, under authority of the fiscal year 1849 appropriation (9 Stat. 321, 322).

Successive appropriations escalated the Federal contribution and within 6 years it became clear that organizational improvements were necessary. In December 1854, Congress enacted legislation (10 Stat. 597) that authorized the establishment of additional stations to be cared for by the lightkeepers as part of their regular duties, the appointment of a keeper of such stations, under instructions from the Secretary of the Treasury, and the care and preservation of lifeboats. Sundry appropriations thereafter either established or supported other such stations, or, in essence, contracted out for similar service from private associations, such as the Massachusetts Humane Society.[30]

By the 1870's, a series of serious problems plagued the lifesaving service. A report from Capt. John Faunce of the Revenue-Cutter Service, submitted August 9, 1871, cited a number of these difficulties finding that:

> Most of the stations [were] too remote from each other; that some of the keepers were too old for active service, others lived too far from their stations, and few of them were really competent for their positions; that politics had had more influence in their appointment than qualification for the duties required of them; that the houses were much dilapidated, many being so far gone as to be worthless, and the remainder were in need of extensive repairs and enlargements; that with but few exeptions they were in a filthy condition, and gave every evidence of neglect and misuse; that the apparatus was rusty for want of care, and some of it ruined by the depredations of vermin and malicious persons; that many of the most necessary articles were wanting, and at no station was the outfit complete; that at some of the stations such indispensable articles as power, rockets, shot lines, shovels, etc., were not to be found, and that at others not a portable article was left.[31]

This "deplorable condition of decay and inefficiency * * * marked the end and climax * * * of the system" as it had evolved under the 1854 statute.[32] A new "volunteer" system replaced it with enactment of the fiscal year 1872 appropriations (17 Stat. 5, 12), authorizing the Secretary of the Treasury "to employ crews of experienced surfmen at such stations and for such periods as he

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[29] Smith and Powell, "The Coast Guard," p. 24.
[30] Ibid., p. 27.
[31] Summary of findings in a report by Revenue-Marine Chief Sumner Kimball. "Report Relative to the Claims of Representative W. A. Newell as Originator of the Life-Saving Service." U.S. Congress. Senate Document 270, 55th Congress, 2d session. Quoted in Smith and Powell, "The Coast Guard," pp. 27-28.
[32] Ibid., p. 28.

may deem necessary and proper." Under Sumner Kimball's chiefship of the Revenue-Marine, in 1871, the Life-Saving Service became an administrative unit within the Revenue-Marine Service Division. Despite its growth and nurturing under the Revenue-Marine, the Life-Saving Service, in 1878, was granted separate bureau status within the Treasury Department.

The organic act of 1878 (20 Stat. 163), following congressional investigations of two serious maritime disasters,[33] provided for the appointment of a General Superintendent of the Life-Saving Service by the President, subject to Senate advice and consent, and an assistant to the General Superintendent appointed by the Secretary of the Treasury. The enactment also set schedules for times when the stations were to be open, established rates of compensation and administrative duties, and authorized a separate appointment for a gulf coast superintendent. From this point, the Life-Saving Service continued to operate separately until 1915, when it was merged with the Revenue-Cutter Service to form the Coast Guard.

During the interim 37 years, however, the two services were not completely divorced. For instance, the Organic Act itself authorized the Secretary of the Treasury to detail officers from the Revenue-Marine to act as inspectors of stations under the direction of the General Superintendent. Later authority (Feb. 26, 1889; 25 Stat. 705, 719) reaffirmed the existing policy of permitting two officers of the Revenue-Marine to be detailed for duty in the Life-Saving Service. A 1911 report from the President's Commission on Economy and Efficiency commented on this "rather anomalous condition," finding that at least 13 Revenue-Cutter Service officers were performing duties of the Life-Saving Service.[34]

The rules of the classified civil service were applied to the Life-Saving Service on April 1, 1897, under an Executive order issued the previous year.[35] However, a public law designed to exclude the service from the "spoils system" had been approved as early as mid-1882 (22 Stat. 55, 58), even predating passage of the Pendleton Act and creation of the Civil Service Commission on January 16, 1883 (22 Stat. 403). The 1882 statute called for appointments of district superintendents, inspectors, and keepers and crews of lifesaving stations to be made "solely with reference to their fitness and without reference to their political or party affiliations." (22 Stat. 58)

Coast Guard

ESTABLISHMENT, 1915

The official establishment of the Coast Guard occurred on January 28, 1915 (Public Law 63-239; 38 Stat. 800-802), with the consolidation of the Revenue-Cutter and the Life-Saving Services in the Treasury Department. This, however, was in contradistinction to the recommendations made just 3 years earlier by the President's

[33] Ibid., p. 28.
[34] Report dealing with the Life-Saving Service was submitted on Dec. 27, 1911, and reprinted as part of the collected set of similar reports in: Taft Commission, 1912 report, p. 87.
[35] Smith and Powell, "The Coast Guard," p. 32.

Commission on Economy and Efficiency in Government Service, commonly referred to as the Taft Commission, and President Taft's own modification of one of the proposals. The Taft Commission recommended that:

> The Life-Saving Service, then a distinct bureau in Treasury, be consolidated into the Bureau of Lighthouses in the Department of Commerce and Labor, a proposal accepted by President Taft; and
>
> The Revenue-Cutter Service be abolished as a separate bureau in Treasury and its functions and duties be divided among other services, with cutters and personnel being transferred to the Navy and the remaining resources to other departments, such as Commerce and Labor.[36]

The President's own recommendation regarding the Revenue-Cutter Service modified that of the Commission by transferring all of its vessels and equipment to the Commerce and Labor Department, assigning them to the Lighthouse Establishment, the Bureau of Fisheries, and to other departmental services as the Secretary deems appropriate. The Commerce and Labor Secretary, in turn, would have been authorized, under Taft's proposal, to "turn over to the Navy such vessels as he may find, upon investigation, not to be required by his department and which by their character are fitted to serve as useful auxiliaries to the Naval Establishment."[37] The President's modification of the Commission's proposal, the former focusing on the civil priorities of the Service and the latter on its military, was developed in response to questions from the heads of agencies receiving the resources, personnel, and duties:

> . . . on the one hand the Secretary of the Navy raises the question as to whether these duties can be performed by the regular Naval Establishment without detracting from its military efficiency, while on the other hand the Secretary of Commerce and Labor raises the question whether certain of these duties can not be performed by the Lighthouse Service if that service is provided with vessels suitable for the purpose.[38]

There is an element of irony in the Navy's questioning of its capacity to handle the myriad civil duties of the Revenue-Cutter Service, in light of the Navy's earlier periodic attempts to absorb the Service and the Service's opposition based in part upon the Navy's perceived "unfitness for the work."[39] Neither the proposals affecting the Life-Saving Service nor the Revenue-Cutter Service that emerged from the Taft Commission, either directly or as modified by the President, were adopted by Congress. This was due to such factors as the conflict between the Commission recommendation and that of the President regarding the Revenue-Cutter Service, questionable assumptions and conclusions of the Commission, the ongoing success of the Revenue-Cutter Service in assuming new duties while maintaining its capabilities in other areas, uncertainty about the eventual disposition and implementation of the many functions and duties of both Services, and certain political realities which opposed the President's or the Commission's recommendations.[40]

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[36] Taft Commission, 1912 report, pp. 7, 45, and 269.
[37] Ibid., p. 9.
[38] Ibid.
[39] Ibid., p. 336.
[40] For a review of the developments, proposals, and objections associated with the Taft Commission, see Evans, "The U.S. Coast Guard," pp. 206–217.

With regard to the last point, President Taft's difficult renomination campaign and his—ultimately losing—reelection bid in 1912 undoubtedly limited the time and effort he could devote to the less immediate concerns of executive branch reorganization. Moreover, his own Secretary of the Treasury, Franklin MacVeagh, took issue with the Commission's basic interpretation and recommendation, praising the existing system with the Revenue-Cutter and Life-Saving Service located in Treasury. In a letter to the President adamantly opposing the Taft Commission, Secretary MacVeagh raised a different option:

> To disassociate the Life-Saving Service and the Revenue-Cutter Service would be disastrous. We have been working to secure a closer relationship between the two services; and that is the line of progress; that is the line of development. I say this without any hesitation or doubt whatever. It would be the greatest mistake in the world to add any further separation between these two great services. Indeed, I think it might be very well a little later to make the Life-Saving Service a part of the Revenue-Cutter Service, and I believe that will be done.[41]

Treasury Secretary MacVeagh, with the combined efforts of the Life-Saving Superintendent, the Revenue-Cutter Chief, and former Chief Kimball, drafted a bill for the merger of the two Services and retention of the proposed unit in Treasury. Chance also intervened to bolster this plan, when a marine distress incident off the Long Island coast demonstrated the interdependency between cutter personnel and lifesavers.[42] Moreover, the sinking of the *Titanic* in 1912 dominated public attention and gave increased visibility to safety on the high seas, a responsibility the Revenue-Cutter Service would assume the following year.

On June 5, 1912, Senator Charles Townsend introduced the first bill to consolidate the two Treasury Services, as advanced by Secretary MacVeagh; but it was not acted upon before the end of the Congress. March 4, 1913, marked the end of the Taft administration, but the succeeding Wilson administration placed a high priority on similar legislation, which also enjoyed bipartisan support. President Wilson wrote to express his "very great interest in the bill [S. 2337] * * * which provides consolidation of the Revenue-Cutter and Life-Saving Services. It is of the highest consequence for the efficiency of both services * * *."[43] Easy passage in both Chambers resulted, and the actual merger between the two Services occurred on January 30, 1915, just 2 days after the legislation was signed by the President.

In addition to transferring all the duties previously performed by both the Revenue-Cutter and Life-Saving Services to the new Coast Guard in the Department of the Treasury, the organic legislation continued to permit the new Service to operate as part of the Navy "in time of war or when the President shall so direct." At the time of the merger, the basic duties of the Coast Guard were classified as follows:

1. Rendering assistance to vessels in distress and saving life and property.
2. Destruction or removal of wrecks, derelicts, and other floating dangers to navigation.

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[41] Taft Commission, 1912 report. p. 384.
[42] See Evans. "The U.S. Coast Guard," p. 214, for further description of the incident.
[43] Letter from President Woodrow Wilson, to House Democratic leader Oscar W. Underwood, following passsage of the bill by the Senate, in: Congressional Record, vol. 52, Jan. 20, 1915, p. 1964.

3. Extending medical aid to American vessels engaged in deep sea fisheries.
4. Protection of the customs revenue.
5. Operating as a part of the Navy in time of war or when the President shall direct.
6. Enforcement of law and regulations governing anchorage of vessels in navigable waters.
7. Enforcement of law relating to quarantine and neutrality.
8. Suppression of mutinies on merchant vessels.
9. Enforcement of navigation and other laws governing merchants vessels and motorboats.
10. Enforcement of law to provide for safety of life on navigable waters during regattas and marine parades.
11. Protection of game and the seal and other fisheries in Alaska, etc.
12. Enforcement of sponge-fishing law.
13. International ice patrol of the Grand Banks.[44]

Administratively, the new Service was placed under the supervisory jurisdiction of the Assistant Secretary of the Treasury and headed by a Captain Commandant. Two divisions—of Operations and of Material—were created immediately, supplemented by several "offices" (later also titled divisions) dealing with construction and repair, engineering, and inspection.[45] The Field Service was divided into 24 administrative units.[46]

MILITARY INVOLVEMENT

Since 1915, the USCG has been involved in the four major military conflicts that the United States has entered. World War I and World War II brought about the traditional transfer of the Coast Guard to the Navy, in both cases through Executive orders issued by the President, where it operated for the duration of the wars. During the Korean and Vietnamese conflicts, neither of which was an officially declared war, involvement by the Coast Guard differed both from that of the earlier wars and from each other.

Shortly after its establishment, United States entrance into World War I resulted in the transfer of USCG to the Navy on April 7, 1917 (E.O. 2587), where it remained until August 28, 1919 when it was returned to the Treasury Department (E.O. 3160). Prior to its World War I entrance, USCG's military capacity had already been supplemented by Exective order (E.O. 2378, issued on May 2, 1916) and by public law (Public Law 64-238; 39 Stat. 600; approved Aug. 29, 1916), both of which affected its wartime administration. Writing about that participation in 1917, the Coast Guard noted that "in all wars to which the United States has been a party the Government has had at hand an auxiliary force * * * ready to become a part of the regular naval forces * * *. This attribute is now the paramount function of the Coast Guard, as all its facilities are now being employed in the prosecution of the existing war."[47] Recognition of the success of that temporary merger encouraged yet another attempt by the Navy to make it permanent, leading to later congressional hearings on the proposed transfer but no agreement.[48]

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[44] U.S. Coast Guard, "Functions, Duties and Organization of the U.S. Coast Guard," p. 2.
[45] Public Law 63-239 only called for "two chiefs of division" but within 2 years of the establishment, the original 3 other "offices" were designated as separate Divisions within the general administration. Ibid., p. 3.
[46] Ibid., pp. 3-12.
[47] Ibid., p. 2.
[48] Bragaw, "Managing a Federal Agency," p. 257.

During World War II, the Coast Guard was a part of the Navy from November 1, 1941 (transferred by E.O. 8929), until January 1, 1946 (the effective date of E.O. 9666, issued December 28, 1945, by President Truman). Even prior to the actual transfer to the Navy, Congress had amended the Organic Act to insure that the Coast Guard "shall be a military service and constitute a branch of the land and naval forces of the United States at all times" (55 Stat. 585; July 11, 1941), in comparison to the language of the 1915 act, which simply stated that the Coast Guard "shall constitute a part of the military forces * * *." (38 Stat. 800) During the World War II period, the Bureau of Marine Inspection and Navigation in the Department of Commerce, originally established in 1838 as the Steamboat Inspection Service, was transferred temporarily to the Coast Guard because of the former's potential assistance in enforcement of marine safety laws and regulations. That transfer was made permanent by Reorganization Plan No. 3 of 1946 (60 Stat. 1097), thereby integrating with the Coast Guard another agency responsible for preventing and averting marine disasters.[49]

In the Korean "police action," with U.S. troops comprising the majority of United Nations forces, the USCG was neither transferred to the Navy nor involved in direct combat. Instead, its role was confined to port security activities in the United States, greatly expanded to protect munitions shipments and harbor facilities, and to aiding in organizing and establishing the South Korean Coast Guard.[50] The port security program was based on legislation approved August 9, 1950 (Public Law 81-679; 64 Stat. 627), commonly called the Magnuson Act on behalf of its chief Senate sponsor, Warren G. Magnuson. Under the measure, the Coast Guard received broad powers, when directed by the President, to search all foreign vessels entering U.S. territorial waters and to control their movements in U.S. ports. It was not until October 18, 1950, that President Truman issued an order (E.O. 10173) exercising the authority granted by the enactment, and it has remained in effect ever since.

Vietnam presented another distinguishable type of Coast Guard military participation. As with Korea, the Vietnam conflict generated no official declaration of war and no express Executive order transferred the Coast Guard to the Navy, in contrast to previous wars that involved the Coast Guard or its predecessors as part of the Navy. Yet, unlike Korea, a portion of the Coast guard—a specially formed squadron, initially consisting of 17 vessels in 1965, and growing to 26 in 1966—was placed "under the operational control of the Navy's 7th Fleet."[51] The joint Navy-Coast Guard mis-

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[49] Evans, "The U.S. Coast Guard," pp. 218-219.

[50] Bloomfield, "The Compact History of the U.S. Coast Guard," p. 286; and U.S. Department of the Treasury, " U.S. Coast Guard: A Study of Its Origin, Responsibilities, Relationships, and Direction," pp. 8-9.

[51] U.S. Secretary of the Treasury, "Annual Report, Fiscal Year 1965," Washington, U.S. Government Printing Office, 1965, p. 143. Further description of the Coast Guard involvement is found in: U.S. Secretary of the Treasury, "Annual Report, Fiscal Year 1966," Washington, U.S. Government Printing Office, 1966, pp. 149, 154; U.S. Department of Defense, "Annual Report, Fiscal Year 1965," Washington, U.S. Government Printing Office, 1965, p. 269; U.S. Department of Defense, "Annual Report, Fiscal Year 1966," Washington, U.S. Government Printing Office, 1966, pp. 293-294; U.S. Congress, House, Committee on Merchant Marine and Fisheries, "U.S. Coast Guard Activities—Southeast Asia," committee print, 90th Cong., 2d Sess., Washington, U.S. Government Printing Office, 1968; and, most importantly, U.S. Department of the Treas-

sion, a "unique coastal surveillance force," was the inception of Coast Guard activities in South Vietnam that were to encompass port and waterway security, merchant marine details, and navigational aid, along with the loran (long range navigation) system operating out of Thailand.[52] The joint Navy-Coast Guard venture began with a request from the Secretary of the Navy on April 16, 1965, regarding the availability of certain USCG vessels. On April 19, the Coast Guard advised the Secretary of their availability, and 10 days later, a joint memorandum from the Secretaries of Defense and of the Treasury was sent to the President advising him of the proposed deployment of the special USCG squadron. President Johnson's assent was given a day later, April 30. On May 6, the 17 Coast Guard vessels, its initial contribution, were placed under an operational order, promulgated by the Coast Guard; and on June 12, Coast Guard Squadron No. 1 came under the operational control of the Navy fleet responsible for "Operation Market Time," the special coastal surveillance project.[53]

OTHER INSTITUTIONAL ARRANGEMENTS WITH THE DEPARTMENT OF DEFENSE

Numerous institutional relationships exist between the Department of Defense (DOD), especially the Navy, and the Coast Guard, aside from periodic transfers of the USCG at the direction of the President or its cooperation with the Navy during military conflicts. Because of the interrelationship between the express statutory obligations and the potential military duties of the Coast Guard—as with port security, maritime search and rescue, and certain environmental regulatory responsibilities—new institutional arrangements have evolved or have been proposed.

One of those occurred in January 1981, with the establishment of a USCG liaison officer to the Joint Chiefs of Staff (JCS), assigned to the Operations Directorate of the Joint Staff. Currently, a memorandum of understanding is being developed to set forth expressly the responsibilities and duties of the officer.

Several proposals have been advanced that would change the institutional arrangements between the Coast Guard and DOD, including JCS and the Chief of Naval Operations (CNO). One, proposed by the Secretary of Transportation, would authorize the Commandant of the Coast Guard to serve as an official adviser to the JCS. A second proposal is designed to share certain USCG reports with both the Secretary of the Navy and the CNO. Presently, USCG reports related to its regulatory responsibilities are submitted only to the Secretary when, it is argued, they have import for naval and national defense matters and should be transmitted directly to the CNO and thus be made available to the JCS.

The most prominent change carried out in the institutional arrangements involves the creation of the Navy and Coast Guard (NAVGARD) Board, established November 25, 1980 (OPNAVINST

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ury, Coast Guard, "The U.S. Coast Guard in Southeast Asia During the Vietnam Conflict" [by Lt. Eugene Tulich, Public Affairs Department], Washington, 1975. (Hereafter referred to as Tulich's study.)

[52] House Committee on Merchant Marine and Fisheries, "U.S. Coast Guard Activities—Southeast Asia," p. 1.

[53] Chronology and developments recorded in: "Tulich's Study," pp.1-10.

5420.91 and COMDTINST 5420.23). This grouping of senior officers from both Services is intended to provide "high-level coordination on policy matters and issues of mutual Navy-Coast Guard interest * * * and [to make] recommendations to the Chief of Naval Operations and the Commandant of the Coast Guard." The cochairmen of the organization are the Vice Chief of Naval Operations and the Vice Commandant on the Coast Guard. Thirteen other officers serve as standing members, and additional members may be authorized to attend particular meetings. The Board may also establish ad hoc Navy-USCG working groups for specific areas of interest, which, in turn, may submit recommendations to the executive board for further action.

A final action affecting Navy-Coast Guard relationships is the proposed amendment to the Posse Comitatus Act, contained in the fiscal year 1982 DOD authorization act (P.L. 97-86; 95 Stat. 1114-1116). This type of amendment permits the U.S. Armed Forces, including the Navy, to assist in certain law enforcement operations. The most likely kind of assistance would be, according to congressional debate, a sharing of Navy intelligence related to suspected drug trafficking and the use of its equipment to transport law enforcement personnel under certain emergency conditions.[54] Such Navy efforts relieve or supplement normal Coast Guard (and Drug Enforcement Administration) activities and, consequently, would reverse the roles traditionally played by the two Services. Instead of the Coast Guard assisting the Navy in the latter's express—national defense and military—responsibilities, the amended Posse Comitatus Act brings about Navy assistance for express Coast Guard operations, including law enforcement on the high seas. A major difference, however, is the continued power of the Secretary of Defense to control the Navy in any such endeavors. This is in contrast to the absence of authority of the Secretary of Transportation, and formerly Treasury, over the Coast Guard once it transferred to the Navy or, as in the Vietnamese war experience, is under the operational control of the Navy.

MAJOR NEW AUTHORITY SUBSEQUENT TO ESTABLISHMENT

Shortly after its establishment-in January 1915—and the assumption of all the authority previously possessed by the Life-Saving and Revenue-Cutter Services, the Coast Guard received new powers augmenting its enforcement of navigation regulations. An enactment on March 4, 1915 (38 Stat. 1053) broadened the enforcement powers of the "Revenue-Cutter Service" (the legislative language still used the obsolete name) at the direction of the Treasury Secretary, with regard to anchorage grounds when the Secretary of War designated them to be required for safe navigation by maritime and commercial interests and when their establishment had been recommended by the Chief of Engineers.

Among other representative new duties, responsibilities, and activities affixed regularly to the Coast Guard from 1915 through codification of its authority in 1949 are:

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[54] Congressional Record, daily edition, vol. 127, July 8, 1981, pp. H4055-H4070; July 14, 1981, pp. H4275-H4309; July 15, 1981, pp. H4329-H4338; July 16, 1981, pp. H4420-H4486; and Nov. 17, 1981, pp. H8377-H8378.

Search and arrest powers regarding the protection of certain animals in Alaska (43 Stat. 742; Jan. 13, 1925);

Service as examiners of life-boat men on-board passenger vessels, originally intended to be a temporary assignment to assist the Steamboat Inspection Service, which became continuing and permanent (38 Stat. 1182; March 4, 1915);

Maintenance of coastal communications systems, based upon recommendations of the Interdepartmental Board on Coastal Communications, created by E.O. 2318 (Feb. 16, 1916);

Rescue associated with floods on inland waters and equipping, maintaining, and establishing aviation stations (39 Stat. 600–601; Aug. 29, 1916);

Expanded anti-smuggling duties, associated with Prohibition;

Police powers associated with navigational injury, by preventing the discharge of oil into coastal navigable waters (43 Stat. 604; June 7, 1924);

Enforcement of certain fishing regulations, based upon the March 2, 1923 treaty with Great Britain;

Designation, by the Air Coordinating Committee in 1946, as the Federal coordinating agency with primary responsibility for furnishing search and rescue facilities and services to meet U.S. obligations to the International Civil Aviation Organization (ICAO);

Ocean weather-reporting, plane guarding, communications, and assistance operations along transoceanic air routes, as a special U.S. obligation to ICAO (62 Stat. 574; June 22, 1948);

Furtherance of navigational aid, beyond the continental United States (in peacetime) and operating the LORAN system of electronic aids for naval and military forces (62 Stat. 1050–1051; June 26, 1948); and

Codification of the "Coast Guard" duties, responsibilities, and authority, under Title 14, U.S.C. (63 Stat. 495–565; Aug. 4, 1949).

During the 1970's, the Coast Guard acquired new or expanded responsibilities for marine environmental pollution control, port and waterway safety and security, and conservation. Some of the more impressive duties were conveyed through the following legislation:

National Environmental Policy Act (Public Law 91–190; 83 Stat. 852); Water Quality Improvement Act (Public Law 91–224; 84 Stat. 91); Federal Water Pollution Control Act (Public Law 92–500; 86 Stat. 816); Ports and Waterway Safety Act (Public Law 92–340; 86 Stat. 424); Marine Protection, Research, and Sanctuaries Act (Public Law 92–532; 86 Stat. 1052); Oil Pollution Act (Public Law 93–119; 87 Stat. 424); Deepwater Port Act (Public Law 93–627; 88 Stat. 2126); Fishery Conservation and Management Act (Public Law 94–265; 90 Stat. 331); Clean Water Act Amendments (Public Law 95–217; 91 Stat. 1566); Outer Continental Shelf Lands Act Amendments (Public Law 95–372; 92 Stat. 629); and Port and Tanker Safety Act (Public Law 95–474; 92 Stat. 1471).

In 1936, the USCG was the recipient of one of the broadest grants of police authority ever enacted by Congress. Through Public Law 74–755 (49 Stat. 1820–1821), the Coast Guard was "empowered to make inquiries, examinations, inspections, searches, seizures, and arrests upon the high seas, and the navigable waterways of the United States * * * for the prevention, detection, and suppression of violations of laws of the United States * * *." By 1978, according to a survey conducted by the President's reorganization project, more than 40 specific statutory grants of law enforcement authority comprised the Coast Guard's jurisdiction in this regard.[55] Illustrative of the wide-ranging law enforcement operations of the USCG are two other more recent assignments. A 1980 act (Public Law 96–350; 94 Stat. 1159) was passed to facilitate increased enforcement of laws related to the importation of controlled substances; and in 1981, President Reagan issued an Executive order

[55] U.S. Office of Management and Budget. President's reorganization project. "Federal Law Enforcement, Police and Investigatives Activities: A Descriptive Report." Washington, 1978. Appendix B, p. 78.

(E.O. 12324) charging the Coast Guard with enforcing the "suspension of the entry of undocumented aliens and the interdiction of any defined vessel carrying such aliens."

REORGANIZATIONS AFFECTING THE COAST GUARD

A number of actual or proposed reorganizations have affected the Coast Guard since its official establishment in 1915. This section examines the major ones, beginning with its relatively recent, and most important, merger into the new Department of Transportation (DOT), and proceeding to other reorganizations that have affected its internal structure and its relationship with other agencies, and finally, to selective proposals to realine or consolidate the USCG with other agencies.

Merger into new Department of Transportation, 1966–67

Consolidating preexisting agencies with newly created ones, the Department of Transportation became operational on May 1, 1967, based upon legislation enacted the previous year (Public Law 89–670; 80 Stat. 931).

President Johnson's message recommending such an establishment summarized the Coast Guard's role as an agency "whose principal peacetime activities relate to transportation and marine safety."[56] That focus distinguished it from its origins in the Revenue Marine of the Treasury Department, as part of the national fiscal organization through the collection and safe-guarding of customs and tonnage duties. The 1966 report on the proposal, from the House Government Operations Committee, took issue with objections to transferring the Coast Guard from its home of 176 years—the Treasury Department—by the following: "* * * while it [USCG] has a traditional link to the Treasury Department, its primary civil functions relate to maritime and to some extent air transportation. Now that a separate DOT is being set up, that Department is the logical home for the Coast Guard * * *."[57] (There is no immediate indication that the 1966–67 transfer relied upon or was even aware of a strikingly similar recommendation from a 1949 Hoover Commission task force, reviewed below.)

By the transfer, the Coast Guard joined the movement of several other agencies, such as the Bureau of Immigration and the Public Health Service. Those units, which also originated in the Treasury Department, acquired a sufficiently different focus, either through new authorities and duties or through new interpretations of their responsibilities, to warrant transfer to another and newer department.

Merged as an "indivisible unit" into the new DOT, the Coast Guard was granted separate bureau status and "function[ed] as the only maritime operating agency of the DOT since the Congress did not transfer the Federal Maritime Administration from the Department of Commerce."[58] (The Maritime Administration was finally

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[56] U.S. President. Lyndon Johnson. "Message on Transportation, March 2, 1966," p. 3.

[57] U.S. Congress. House. Committee on Government Operations. "Department of Transportation Act; Report to Accompany H.R. 15963." House Report No. 89-1701, 89th Congress, 2d session. Washington, U.S. Government Printing Office, 1966; p. 23.

[58] Davis, "The Department of Transportation," p. 106.

tranferred to Transportation, as Johnson had initially recommended in 1966, on August 6, 1981, by act of Congress. See Public Law 97-31.) In addition, by the merger, the Coast Guard gained responsibility for a new program: That is pilotage on the Great Lakes, since the DOT was assigned administration of the Great Lakes Pilotage Act.[59] Moreover, with the inception of DOT, Coast Guard obligational authority—with expenditures rising from $545,327,000 in fiscal year 1968 to an estimated $574,450,000 in fiscal year 1969—was "increased substantially * * * with capital outlays increased materially * * *."[60]

Other reorganizations

From 1915 until its consolidation into the DOT in 1966, the Coast Guard weathered a number of reorganization proposals, including the attempt described earlier by the Navy after World War I to retain it. USCG success in maintaining its position within Treasury is reflected indirectly by a 1939 statute (53 Stat. 561) that conferred reorganization authority on the President but expressly made the Coast Guard—along with other, mostly independent, commissions and boards—immune from being transferred under it. Moreover, in that same year, the Lighthouse Service, celebrating its 150th anniversary, was acquired by the Coast Guard through Reorganization Plan No. 2 of 1939 (53 Stat. 1431), pursuant to the reorganization authority that had exempted the USCG from abolition or transfer.

Shortly after the 1939 developments, and in response to pressing demands of World War II, the Bureau of Marine Inspection and Navigation was temporarily transferred to the Coast Guard, as noted above. That reassignment became permanent on January 1, 1946, through an Executive order issued by President Truman on December 28, 1945 (E.O. 9666).

Internal Coast Guard transformations occurred in 1949, along with the codification of its authority as part of title 14, United States Code, that same year. The initiative for such a change transpired in 1947, during House Appropriations Committee hearings on the fiscal year 1948 budget requests from USCG. The committee recommended, and Congress concurred, that there should be a "study of the administrative, management, and fiscal policies and affairs of the Coast Guard, such study to be made by such persons or organizations, as may be designated by the Secretary of the Treasury and the Chairmen of the Committees on Appropriations * * *" (61 Stat. 702). The consultant selected was the Ebasco Corp. of New York, whose report "completely sustained the Coast Guard's requests for appropriations * * * [recommending] a sizable increase in personnel and operating funds * * * [and finding] that Federal statutes were either vague or lacking in exactly specifying Coast Guard tasks and missions."[61]

Other internal changes were dictated by "an exhaustive interdepartmental study of Coast Guard Roles and Missions," conducted in 1962 at the request of Treasury Secretary Dillon.[62] The intent was

[59] Ibid., p. 107.
[60] Ibid., pp. 107 and 110.
[61] Summary of Ebasco report in Capron, U.S. Coast Guard, pp. 176-177.
[62] U.S. Treasury, "U.S. Coast Guard: A Study," p. 7.

to "define for the first time in its history * * * the scope and extent of its responsibilities," as classified under its 10 major missions at the time: Port security, military preparedness, aids to navigation, oceanography, law enforcement, search and rescue, ocean stations, merchant marine safety, reserve training, and icebreaking.[63]

Proposed reorganizations

Because of its multimission capability and service orientation, the USCG has been subject to proposed reorganizations in civil areas, as well as the periodic proposals to merge it into the Navy. The most prominent of these is in the law enforcement field, especially border security to combat illegal immigration or illicit drug trafficking or both.

Regarding immigration law enforcement, President Hoover, in 1930, recommended unification of the three main border patrol units—the Immigration Border Patrol of the Immigration and Naturalization Service, then in the Labor Department, the Customs Patrol, and the Coast Guard—under the jurisdiction of the Coast Guard. Incorporated in H.R. 11204, in the 71st Congress, the proposal passed the House but not the Senate, in part because of the perceived incompatibility of the missions of the agencies involved.[64] Then Under Secretary of the Treasury Ogden Mills commented on this theme:

> The Coast Guard has other duties more important than the prevention of smuggling on our land borders. . . . Patrolling our land borders is essentially a police function. The Coast Guard proper is a naval organization charged with the duty of protecting life at sea and enforcing on our ocean boundaries the laws of the United States. We do not propose to make policemen of our sailors. But we do want to avail ourselves of their central organization.[65]

The same reorganization was advanced by President Hoover 2 years later, under his new reorganization authority, but was defeated through a resolution of disapproval by the House on January 19, 1933, following recommendations by its Committee on Expenditures in the Executive Branch.[66] Commenting on these defeated recommendations, Arthur Millspaugh also contended that only the "appearance of duplication" would be ended with a consolidation of such border patrol units and that "inevitably, considerable damage would be done to the continuity and unity of operations" within the agencies which would lose their border patrols to the Coast Guard.[67]

Forty-four years later, in 1977, a similar reorganization proposal was raised. The Office of Drug Abuse Policy (ODAP) reviewed the problems of border management, duplication, lack of cooperation and coordination, and inadequacy of resources. The ODAP report presented four options to deal with these concerns, one of which

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[63] *Ibid.*

[64] Congressional Record, vol. 72, July 1, 1930, pp. 12217-12237.

[65] U.S. Congress. House. Committee on Interstate and Foreign Commerce. Border Patrol. Hearings, 71st Congress, 2d session, Apr. 24 and 25, 1930. Washington, U.S. Government Printing Office, 1930, pp. 5–6.

[66] President Hoover's Executive Order 5966 was one of 11, affecting 58 Government agencies, which he submitted in late 1932, following his reelection loss to Franklin Roosevelt. The resolution of disapproval (H. Res. 334) was agreed to by the House on Jan. 19, 1933. Congressional Record, vol. 76. Jan. 19, 1933, pp. 2110–2126.

[67] Millspaugh, "Crime Control by the National Government," pp. 200–201.

was the creation of an expanded multipurpose border management agency, composed of INS, Customs, and the Coast Guard.[68] However, the recommendation of the review team advanced a modified version of this option, leaving out the Coast Guard from the consolidation of Customs and INS into a new agency.[69]

The ODAP report, actually prepared during the Ford administration, was echoed in the succeeding Carter administration. Under the aegis of the President's reorganization project (PRP), a draft report was released in 1977, also recognizing several distinct options for effecting improvements in border management to stem illegal immigration and illicit drug trafficking.[70] Although the PRP omitted the USCG from a proposed Border Management Agency, to be located in either Treasury or Justice, it recognized Coast Guard's potentially important but then "deemphasized * * * law enforcement role" by raising an option that would have transferred the Coast Guard to the Department—Treasury or Justice—housing the new Border Management Agency.[71]

Another proposed reorganization affecting USCG was advanced by the first Hoover Commission. Its 1949 report identified the Treasury Department as one of the largest and most internally diversified departments. In order to rid the Department of its nonfiscal elements, the final Commission recommendation proposed to transfer the "Coast Guard and probably certain of the marine functions of the Bureau of Customs, to the Department of Commerce."[72] Although that specific recommendation was not acted upon at the time, it and another forerunner were harbingers of the eventual Coast Guard transfer. The Commission's Task Force on Fiscal, Budgeting, and Accounting Activities had already proposed that the "marine activities recently assigned to the Bureau of Customs should go along with the Coast Guard" to a proposed Department of Transportation.[73] In fact, when such a department was created in 1967, some Customs marine activities were consolidated into the Coast Guard before its transfer.

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[68] U.S. Executive Office of the President. Office of Drug Abuse Policy. "Border Management and Interdiction—An Interagency Review." [Washington] 1977, pp. 46-59.

[69] Ibid., p. 59.

[70] U.S. Office of Management and Budget. President's reorganization project, "Reorganization Options Related to Border Management" (draft report). Washington. Dec. 14, 1977.

[71] Ibid., p. 25. None of the alternatives or options were acted upon, since the administration deferred and eventually abandoned the introduction of any plan to Congress. This occurred "reportedly because of criticisms from various Hispanic groups and the INS labor union," which perceived that the most likely realignment—transferring INS to Treasury—would adversely affect their interests and policy positions. U.S. Congress. Senate. Committee on the Judiciary. History of the Immigration and Naturalization Service." Committee print, 96th Congress, 2d session. Washington, U.S. Government Printing Office, 1980, p. 85.

[72] U.S. Commission on the Executive Branch of the Government. "Treasury Department: A Report to the Congress." Washington, U.S. Government Printing Office, 1949, p. 6.

[73] U.S. Commission on the Executive Branch of the Government. Task Force on Fiscal, Budgeting, and Accounting Activities [appendix F]. Washington, U.S. Government Printing Office, 1949, p. 17.

PART II.—RESOURCE REQUIREMENTS DETERMINATION*

The USCG fiscal planning process employs a "Planning, Programing and Budgeting System" modeled after the one in use in the Pentagon. According to the Coast Guard's October 1980 military personnel requirements study, this is a management tool consisting of:[1]

One, *Planning* which is defined as the establishment of objectives and alternative ways of achieving them, the identification of future environments, the development of contingencies and alternative responses, and forecasting of the future consequences of present decisions.

Two, *Programing* which is defined as a method or system of describing activities according to their outputs and of relating these outputs to the costs (inputs) required to produce a specified level of output.

The essential characteristics of this planning and programing system are: (1) Careful specification and systematic analyses of objectives; (2) design of programs to satisfy these objectives; (3) search for all relevant alternatives for program performance; (4) estimation of the life-cycle (total) cost of each alternative; (5) estimation of the effectiveness of each alternative; (6) comparison and analysis of the alternatives, seeking the optimum combination of alternatives; and (7) translation of the selected alternative(s) into identifiable budget requirements.

The output of the planning and programing process is the budget request which is submitted sequentially to the DOT, Office of Management and Budget (OMB), and the Congress.

The principal products of the system, which focus the resource allocation effort and record the decisions of the policymakers are described in the study and in a comprehensive overview of Coast Guard management practices by Louis Bragaw, a former head of the Coast Guard Academy's Department of Economics and Management.[2]

The Long Range View is a policy document, prepared annually, that provides a 25-year perspective on the future environment in which the Coast Guard would be expected to operate. It promulgates the formal Coast Guard objectives—currently seven—which constitute the strategic profile of the agency. These objectives thus define the Commandant's view of what must be done by the Coast Guard.

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*Prepared by Alva Bowan, specialists in National Defense, Foreign Affairs and National Defense Division.

[1] U.S. Department of Transportation, U.S. Coast Guard. "U.S. Coast Guard Military Personnel Requirements: Report to the Department of Transportation and the Office of Management and Budget." Washington, D.C. October 1980. Pp. I-4, I-5.

[2] Bragaw, Louis K. "Managing a Federal Agency: the Hidden Stimulus." Baltimore and London, the Johns Hopkins University Press, 1980.

Operating Program Plans are the key documents in resource requirements determination. Prepared biannually by the program directors for approval by the Commandant, they transform the broad objectives of the long-range view into detailed action plans for the next 10 years. Subobjectives and goals are defined and program standards developed which show alternative sets of milestones leading to various levels of achievement of the subobjectives. For purposes of our report, two levels of achievement are pertinent, and are defined here:

Level A—the optimum level of performance of the program where marginal benefit is equal to marginal cost or where all statutory tasks are properly accomplished. It is designated as 100 percent performance of the program standard.

Level C—performance at the current level of operation within any program.[3]

Resource needs are defined for each level of achievement. "By establishing alternative milestones the program standards enable the Commandant to select a specific degree of accomplishment of a program in response to changing public demands or budgetary climates."

The program plans have evolved over the past several years to include, in a single document, the overall planning material for each operating program. They have thus become the basic building blocks of the Coast Guard's resource allocation process, meeting items 2 through 5 of the required characteristics of the planning and programing system as defined at the beginning of this chapter.

Support Program Plans, in addition to the operating programs, the Coast Guard program structure includes a number of "internal supporting programs" that extend across operating program lines. Bragaw lists the following support programs:[4]

> General administration; personnel support; engineering support; financial management, personnel, supply, and automatic information systems support; research, development, test, and evaluation support; medical support; legal support; safety program support; civil rights support; public and international affairs support; retired pay; intelligence and security support; and communications services support.

According to Bragaw, each support program has a director, usually the rear admiral who is chief of the related office at headquarters. It is not uncommon for one director to oversee the activities of several generally related programs. The directors are assisted by support managers who are intimately involved with the programs they manage. The program is often the manger's sole responsibility. Program planning for support programs follows a similar pattern to that for the operating programs.[5] According to the military personnel requirements study, about 35 percent of the Coast Guard's personnel requirements are generated by these support

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[3] It was determined by the Coast Guard Military Personnel Requirements Study Group that this performance level is sustainable with current assets in the short term, but would entail gradual exhaustion of capital and/or personnel resources to the point of functional impairment over the long term unless current resource levels are increased. The study group thus defined two levels of personnel requirements for this performance level: level C—depletion, and level C—nondepletion. By extension, two levels of requirements for performance level C could be defined for other resources than personnel.

[4] Bragaw, "Managing a Federal Agency," p. 51.

[5] Ibid., pp. 50–57.

programs.[6] A much higher percentage of their civilian personnel requirements are attributed to support.

Facility Plans integrate the requirements of the individual programs and take advantage of the multimission concept of Coast Guard operations. Separate 10-year plans for cutters, boats, aircraft, and shore facilities integrate the resource requirements defined in the program plans, taking into account savings achieved by simultaneous multimission employment of these operating units. A *Capital Investment Plan* summarizes and reconciles these facilities plans. The facility plans show "the requirements for operational hours for ships, boats and aircraft and for operational networks for boats, ships and aircraft and shore facilities." They compare available assets to the expressed demands of the program plans—adjusted to account for multi-mission savings—and calculated deficiencies. They project availability of assets, considering retirement schedules, delivery schedules of new equipment, "offline" time for maintenance and training, et cetera. And they show time-phased schedules for acquiring new or replacement facilities to meet the goals set by the requirements determination process.

Determinations are a mechanism through which the Commandant sets priorities and chooses responses of the Coast Guard for the coming budget year. *Draft Determinations,* prepared by the program manager, usually reflect actions laid out in the first year of the 10-year operating program plan. The ensuing consideration of the draft insures short-run factors, particularly budgetary climate, are taken into account. At this stage, the competition for resources among the various operating programs is addressed for the budget in preparation. Subsequent steps in the PPBS cycle convert the guidance contained in the determinations into *Resource Change Proposals* which compete for inclusion in a *Preview Budget* where competing priorities are finally resolved. Our report is not concerned with these final stages of resource allocation since, by that time, the issues are over priorities rather than the requirements themselves. However, it should be apparent that the most carefully developed program plan can fail at this stage should the program not compete successfully for funding.

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[6] "U.S. Coast Guard Military Personnel Requirements Study," p. IX-2. The figure given in our report combines "Operational and Institutional Support" and "Training" which, according to the study report is a subset of support. A more or less comparable figure for the DOD is 50 percent, however, since the two programming systems use differing definitions of the "support" category, direct comparison may be misleading.

DEVELOPMENT OF OPERATING PROGRAMS*

Louis Bragaw devotes a chapter to the planning process and a detailed examination of the development of specific operating program plans.[1] The "dual-role strategy and multimission concept" governing the Coast Guard has generated seven current strategic objectives:

1. To minimize loss of life, personal injury, and property damage on, over, and under the high seas and waters subject to United States jurisdiction.
2. To facilitate waterborne activity in support of national economic, scientific, defense, and social needs.
3. To maintain an effective, ready, armed force prepared for and immediately responsive to specific tasks in time of war or emergency.
4. To assure the safety and security of ports and waterways and their related shoreside facilities.
5. To enforce federal laws and international agreements on and under waters subject to United States jurisdiction and on and under the high seas where authorized.
6. To maintain or improve the quality of the marine environment.
7. To cooperate with other government agencies and entities (federal, state, and local) to assure efficient utilization of public resources.[2]

Those objectives, in turn, are interrelated with specific operating programs, described in the USCG "Planning and Programing Manual" as "a major Coast Guard endeavor defined in terms of specific actions and resource allocations required to reach an objective."[3] As Bragaw summarizes the interrelationship, "Each of the seven strategic objectives encompasses one or more programs, and a program may contribute to more than one objective."[4] For example, the operating program plan for the port and environmental safety program for fiscal years 1983–92 cites five of these strategic objectives.[5] Likewise, a number of the programs, among them port and environment safety, domestic ice operations, and commercial vessel safety, indicate that one of their main objectives is to minimize the loss of life.[6]

The actual number and content of operating programs has varied over time and in terms of classification for different purposes.

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*Prepared by Frederick M. Kaiser, specialist in American National Government. Government Division.

[1] Bragaw, "Managing a Federal Agency," pp. 41–69.

[2] Ibid., p. 47; taken from U.S. Coast Guard, 1976–86 plan summaries.

[3] U.S. Department of Transportation. Coast Guard. "U.S. Coast Guard Planning and Programming Manual." Washington, 1977 p. I–10.

[4] Bragaw, "Managing a Federal Agency," p. 50.

[5] U.S. Department of Transportation. Coast Guard. "Port and Environmental Safety, Fiscal Year 1983–92; Operating Program Plan (G–WPE)," Dec. 8, 1980, p. I–1.

[6] The following operating program plans for fiscal years 1983–92 are the ones to be examined in the remainder of this report and hereafter will be cited by their title, without continued reference to the coprorate author, the U.S. Department of Transportation. Coast Guard: Bridge Administration, June 23, 1980; Commercial Vessel Safety, Oct. 20, 1980; Recreational Boating Safety, Feb. 4, 1981; Domestic Ice Operations/Polar Ice Operations, Dec. 11, 1980; Short Range Aids to Navigation, June 16, 1980; Radionavigational Aids, July 31, 1980; Marine Environmental Response, Jan. 26, 1981; Waterways Management, Jan. 26, 1981; Search and Rescue, Sept. 10, 1980; and Port and Environmental Safety, Dec. 8, 1980. A 12th program, Enforcement of Laws and treaties, is also examined, although the program plan was incomplete and not available.

Bragaw, writing in 1980, identified 14 operating programs, along with 13 support ones.[7] These can be distinguished from the 22 categories of active programs reported for the agency shortly after its transfer to the DOT,[8] and to the 7 direct programs that serve as budgetary guidelines for USCG appropriations requests to the Congress.[9] Those seven progrom categories for fiscal year 1982 may combine several otherwise separately identifiable operating programs. For instance, the "aids to navigation" program in the fiscal year 1982 budget justification includes not only short-range and radio navigational aids but also bridge administration and domestic ice operations,[10] thereby consolidating 4 normally distinct operating programs under one heading.

Defining an operating program in terms of "specific actions and resource allocations * * * to reach an objective," as does the Coast Guard, allows for flexibility and adaptability in meeting those objectives. Despite that benefit, this definition of a program and its attendant implementation harbors a weakness: That is, it makes it difficult, if programs are recombined or realined over time, to compare and contrast them. Although most of the programs have remained relatively constant, two variations from even the 1980 listing exist, viz., ice operations and marine environmental protection/security. In the former, the previously consolidated domestic and polar ice operations now have separate program objectives, subobjectives, goals, and milestones, as portrayed in the relevant program plan, fiscal years 1983–92.[11] Regarding environmental and port security/protection, in 1980, there were separate programs in marine environmental protection and in port safety and security. The most current program plans (for fiscal years 1983–92), however, include different combinations: That is, marine environmental response and port and environmental safety, the latter of which is a newly reorganized program.

The program is the "basic building block," according to Bragaw's account, of the Coast Guard's strategy, policymaking, and resource allocation processes.[12] The planning process itself involves both long-range and short-term objectives and needs and is affected by a variety of levels in the organizational structure of the Coast Guard. It is "interactive" in nature—that is, "the Commandant has a continuous and involved dialogue with both the program directors and the district commanders at each stage of the planning process"—rather than being either dictated by the Commandant's office or composed exclusively by program directors and district officers.[13]

The program process, interacting with the planning process, is "adversary in nature," with those advocating a particular course of action being called upon to defend it and, if it advances, the "participants progressively change their roles," from critic and review-

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[7] Bragaw, "Managing a Federal Agency," p. 50.
[8] Davis, "The Department of Transportation," p. 107.
[9] U.S. Congress. House. Committee on Appropriations. Subcommittee on the Department of Transportation and Related Agencies. Appropriations for 1982. Hearings, 97th Congress, 1st session. Washington, U.S. Government Printing Office, 1981. Part I, 1982 budget justifications, pp. 14–17.
[10] Ibid., p. 14.
[11] "Domestic Ice Operations/Polar Operations," pp. I-1—III-7.
[12] Bragaw, "Managing a Federal Agency," p. 50.
[13] Ibid., p. 56.

er to advocate and defender at different states of the process.[14] Moreover, the planning crosses four levels: Coast Guard-wide planning (at the Commandant's level), multiprogram planning (Chief of Staff), single-program planning (program director), and field planning (area or district commander).[15]

Summaries of Selected Operating Programs

The remainder of this report examines in detail 12 of the Coast Guard's operating programs. The following summaries are based upon the appropriate plan developed for each program for fiscal years 1983–92.[16]

1. ENFORCEMENT OF LAWS AND TREATIES (ELT)

This varied and multifaceted program emphasizes general responsibility for enforcement of U.S. laws and treaties on the high seas and in navigable waters under the jurisdiction of the USCG. Recent priorities focus on combating illegal importation of controlled substances and illegal immigration—as reflected in President Reagan's Executive Order 12324—and on fisheries law enforcement. Developments have also occurred regarding antiterrorism activities, such as the adoption of a memorandum of understanding with the Federal Bureau of Investigation on mutual assistance in combating terrorism in a marine environment.

2. PORT AND ENVIRONMENTAL SAFETY (PES)

This, the first plan of the newly reorganized program, promotes the primary objectives of assuring the safety of vessels, ports, and waterways, and their related shoreside facilities, assuring the security of the same, and maintaining and improving the quality of the marine environment. Consisting of port safety, port security, and environmental protection, PES also is associated with five of the seven strategic objectives, including the minimizing loss of life, personal injury, and property damage; facilitating transportation; maintaining an effective, ready-port organization to respond to specific tasks in time of emergency; enforcing Federal laws and international agreements on waters subject to U.S. jurisdiction; and cooperating with other governmental agencies to assure efficient utilization of public resources and to carry out activities in the international sphere where appropriate.

3. MARINE ENVIRONMENTAL RESPONSE (MER)

The primary objective is to minimize damage caused by pollutants discharged into the marine environment, by responding to the discharge or substantial threat of discharge of oil or designated hazardous substances into U.S. waters. Actions have concentrated on developing an adequate oil containment, cleanup and disposal

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[14] Ibid., pp. 58–59.
[15] Ibid., pp. 60–61.
[16] See citations in footnote 6, supra. Two operating plans, military preparedness/operations program and reserve forces program are not analyzed in detail, but are examined as part of the mobilization and manpower management sections of part IV.

capability; and further efforts are to address special technical problems in oil removal and to improve the response mechanisms.

4. WATERWAYS MANAGEMENT (WWM)

Specific objectives of the program are to: (1) Safeguard persons, vessels, and the marine environment in the Nation's ports, waterways, and offshore approaches from accidental destruction, damage or loss as a result of vessel mishaps; and (2) promote safe and expeditious movement of marine transportation in U.S. ports and waterways.

There are both passive and active concepts in vessel traffic management. Passive traffic management includes use of "rules of the road," traffic routing, and imposition of particular regulations in specific waterways and harbors such as speed limits, vessel size limitations, and restriction of operation to those vessels with particular operating characteristics and capabilities. When personnel not on board a vessel become involved in its operation, directly or indirectly, vessel traffic management becomes active. The vessel traffic services (VTS) are active vessel traffic management systems developed and installed by the Coast Guard in a number of U.S. ports and waterways over the past decade.

5. BRIDGE ADMINISTRATION (BA)

The objective—to ensure safe and reasonably unobstructive navigation through or under bridges spanning the navigable waters of the United States, while meeting the needs of other transportation modes and protecting the human environment—involves 2-year inspections, insuring that bridges are maintained and operated safely, appropriate projections for any new bridges, phasing out of deteriorated or obsolete bridges, and investigating high-accident bridges, among other numerous goals. Certain new legislation has increased Federal funding for replacement, although the outlook projects an increasing number of bridges becoming obstructive as more inland ports are developed to handle ocean traffic.

6. SHORT-RANGE AIDS TO NAVIGATION (SRAN) AND 7. RADIONAVIGATION AIDS (RA)

These two programs, designed to establish, maintain, and operate aids to maritime navigation for various purposes, have different scopes of operation, foci, and methods. The former, SRAN, includes such activities as locating and marking navigable channels in certain waterways, improving mariner identification, and establishing landfall and offshore approach signals, among others. The RA program includes, by contrast, the Loran and Omega systems as well as evaluation of the Department of Defense's NAVSTAR global positioning system.

8. DOMESTIC ICE OPERATIONS (DIO)/POLAR ICE OPERATIONS (PIO)

The formal partitioning of ice operations into DIO and PIO also involved establishing separate program objectives: DIO program is to facilitate and assist U.S. maritime transportation on ice-laden domestic waters and to minimize loss of life, damage to property,

and harm to the marine environment; and PIO program is to cooperate with other organizations to promote the national interests in the polar regions by providing an ice-transiting capability. It is anticipated that demand for services and, concomitantly, the need for resources, will increase in the DIO and PIO programs as a result of expanded marine traffic and extension of the slipping season in ice-covered domestic and polar waters.

9. COMMERCIAL VESSEL SAFETY (CVS)

The objective—to minimize deaths, personal injuries, and property loss associated with vessels and other facilities engaged in commercial or scientific activity in the marine environment—is pursued through various administrative and enforcement techniques. Among those techniques are to be an increased scope and volume of examinations of foreign vessels within Coast Guard jurisdiction for compliance with U.S. statutes and international agreements, establishing international standards on crew qualifications, expansion of safety regulations on the Outer Continental Shelf, and increased research on improving the maneuverability of large vessels.

10. RECREATIONAL BOATING SAFETY (RBS)

The broad objective of seeking cooperative support in achieving safety objectives, rather than through expanded regulation, is to be accomplished through the selective promulgation of cost-effective safety regulations; encouragement of expanded boating education programs by the Coast Guard Auxiliary, the States, and voluntary organizations; greater uniformity and comity in Federal, State, and local boating laws and regulations; and effective allocation and use of Federal, State, and local boating resources through various means, including improvements in accident investigations. Recently, the passage of the Recreational Boating Safety and Facilities Improvement Act involves the Coast Guard in the area of boating facilities development and reinstitutes a program of Federal funding of State boating safety activities. Moreover, a reduction of $2 million in a portion of the RBS program and a reprograming of some of the former RBS resources into the public affairs program, following a merger of the Office of Boating Safety with portions of Public and International Affairs, affected the RBS plan as it developed.

11. SEARCH AND RESCUE (SAR)

Responding to the strategic objectives to minimize loss of life, personal injury, and property damage and to cooperate with other governmental agencies to carry out international activities, the SAR program offers a series of expressly quantified subobjectives: That is, assigning a SAR facility to take action within 5 minutes of initial notification of a call for assistance and locating SAR facilities so that rescue units can, following departure, arrive onscene within 45 minutes for 90 percent of SAR incidents. This elaboration by the SAR plan is the current operationalization of a plan that initially became effective in 1956, when the Coast Guard was desig-

nated as the SAR coordinator for the maritime region. Continuing as the central agency, the Coast Guard's present SAR plan recognizes a changing clientele as well as a restrained Federal fiscal policy, resulting in an increase in SAR coordinating activities, increased Reserve and Auxiliary preparedness, and the need for improved equipment and facilities.

12. MARINE SCIENCE ACTIVITIES (MSA)

The overall objectives of this program are to provide marine science support to all Coast Guard programs and to support other national needs. Specific objectives of the marine science activities program are to: First, conduct the International Ice Patrol; second, provide operational oceanographic services for the support of the search and rescue, marine environmental protection, ice operations, and other Coast Guard programs; and third, to cooperate with and provide assistance to other governmental and scientific organizations in support of national marine science objectives.

The next chapter examines these programs in detail.

PART III.—ANALYSIS OF OPERATING PROGRAM PLANS

ENFORCEMENT OF LAWS AND TREATIES PROGRAM

The USCG is the world's largest marine police force. Despite the many and diverse missions it has been given, the agency's basic law enforcement character has remained constant throughout its history. The Revenue Cutter Service established in 1790 was charged with enforcement of the Nation's tariff laws and the Coast Guard, formed in 1915, absorbed this force and its responsibilities. During the 13 years of prohibition, the Coast Guard played a major role in one of the largest law enforcement efforts of the Nation's history. Events and legislative developments of recent years have combined to emphasize again the policeman aspect of the Coast Guard's missions.

Federal statute establishes the Coast Guard as the sole agency with plenary jurisdiction over violations of Federal law on or under the high seas and on waters subject to U.S. sovereignty. The agency may assist State and local law enforcement authorities and also other Federal agencies in the enforcement of the laws they administer. The Coast Guard's "Boarding Manual" lists 11 "Fisheries and Conservation" laws, 17 "Customs" laws, 15 "Navigation" laws, 5 "Public Health" laws, and 90 "Shipping" laws of specific concern to the Coast Guard. Additionally, there are responsibilities in connection with the Immigration and Nationality Act, firearms control acts, and national security.

The operating program designated "Enforcement of Laws and Treaties" is subdivided into two missions: First, the enforcement of laws and treaties for the protection of living marine resources (fisheries), and second, general law enforcement, which includes the enforcement of all laws and treaties not specifically assigned to other operating programs of the Coast Guard, such as marine environmental protection laws. Currently, the principal targets of the general law enforcement part of the program are illicit drug smuggling and, periodically, illegal immigration.

The 1980 operation to guarantee the safe conduct of undocumented Cuban aliens to the United States was a special effort that commanded a large measure of Coast Guard resources over a 9- to 10-month period.[1] On September 29, 1981, the administration announced the inception of another special program—in this instance an ELT effort exclusively—for the interdiction of vessels carrying undocumented Haitian aliens to the United States (for discussion, see Addendum, p. 48 "Interdiction of Illegal Aliens (Haitian Interdiction Program)").

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[1] The Coast Guard estimates that the operation at times absorbed as much as 85 percent of its assets on the east coast.

GENERAL LAW ENFORCEMENT*

Statutory Basis

General statutory authority for all of the ELT program is set forth in title 14 of the United States Code. In addition to charging the Coast Guard with enforcing or assisting in the enforcement "of all applicable Federal laws on and under the high seas and waters subject to the jurisdiction of the United States," [1] the title further provides specifically that the agency may, when so requested by proper authority, assist any Federal agency, State, or political subdivision of a State, to perform any activity for which it is qualified.[2] Additionally, specific authorization is provided for the Coast Guard to assist foreign governments in the enforcement of their laws, if requested to do so and if approved by the President.[3] The agency may board any vessel subject to U.S. jurisdiction to make inspections, searches, seizures, inquires, and arrests.[4]

Among the Federal statutes most frequently violated on the high seas or in waters subject to U.S. jurisdiction are: (1) The general antismuggling statute (18 U.S.C. 545); (2) The Controlled Substances Import and Export Act (21 U.S.C. 951 et seq.); and (3) The Immigration and Nationality Act (8 U.S.C. 1101 et seq.).

Resource Allocation

Approximately 18 percent of total Coast Guard budget authority is allotted to the ELT program. The fiscal year 1980 allocation for the program, and estimates for fiscal years 1981–82, are as follows:

Resource Allocation (thousands of dollars)

Fiscal year 1980 (actual)	$202,692
Fiscal year 1981 (estimate)	226,559
Fiscal year 1982 (estimate)	[1] 263,775

[1] U.S. Coast Guard. Budget Office. It should be noted that the Coast Guard's method of calculating general administrative and other overhead costs allocated to this activity has been questioned by the Office of Management and Budget.

The Coast Guard estimates that expenditures on the general law enforcement function account for about 50 percent of the ELT totals.

Although nearly equal amounts of money go into the fisheries and general enforcement missions, general enforcement commands a much higher percentage of ELT cutter and aircraft employment hours:

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*Prepared by Harry L. Hogan, specialist in American National Government (Law Enforcement, Criminal Justice and Public Safety), Government Division.

[1] 14 U.S.C. 2.

[2] 14 U.S.C. 141.

[3] 14 U.S.C. 149.

[4] 14 U.S.C. 89.

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[In percent]

	Fish	General
Cutters	30	70
Aircraft	42	[1] 58

[1] U.S. Coast Guard. Operational Law Enforcement Division.

The actual number of hours devoted to general law enforcement in recent years is as follows:

	Fiscal year		
	1980 (actual)	1981 (estimate)	1982 (estimate)
Cutter employment hours	143,000	102,000	100,000
Aircraft employment hours	16,700	7,200	7,700
Seizures	93	200	[1] 100

[1] Ibid.

Of all time spent on general law enforcement, in a normal recent year 90 percent of cutter hours has been devoted to drug law enforcement, and 96 percent of aircraft hours.

According to Coast Guard officials, the current inventory of materiel available for carrying out the general law enforcement mission as well as other duties includes: 18 high-endurance cutters (WHEC);[5] 23 medium-endurance cutters (WMEC);[6] 76 patrol boats (WPB); 25 long-range search aircraft; 13 medium-range search aircraft; 37 medium-range recovery aircraft; and 77 short-range recovery aircraft.

Performance Standards

Although the ELT program lacks an approved operating program plan,[7] standards now being used were set forth in the following excerpt from an October 1980 study entitled "U.S. Coast Guard Military Personnel Requirements":[8]

Program Standard

In order to meet the main ELT objectives which are to enforce laws relating to living resources and to curtail illegal drug traffic, seven goals have been established. These goals and their related milestones are based on a combination of quantitative analyses and experienced judgment. In the area of fishing violations, the milestones are broken down by type of potential violator, since these pose very different enforcement problems. The enforcement levels are determined, in large part, by the description of the enforcement effort required contained in the Fishery Management Plans developed by the Regional Fisheries Management Councils. A recent CG/NMFS study further analyzed enforcement needs. Drug enforcement levels are based on judgment by experienced management and operational personnel on what

[5] Includes five 327-foot cutters and one 311-foot cutter slated to be decommissioned as the new 270-foot cutters come on line.

[6] Includes fifteen 210-foot cutters to be retained; various others will be replaced by 270-foot cutters.

[7] Although a plan exists, it has not been approved by the Department of Transportation or the Office of Management and Budget. Apparently, the goals and milestones listed above comprise a summary of the essential features of the plan.

[8] U.S. Coast Guard. Report to the Department of Transportation and the Office of Management and Budget. October 1980.

is required to detect or deter 75 percent of the violations of the trafficking laws. The other program milestones are based exclusively on experience.

Goal	*Milestone*
1. Enforce federal laws and international agreements relating to living resources, particularly fisheries and marine mammals.	1.A. Detect or deter 95 percent of the foreign violations of laws and treaties involving fisheries. 1.B. Detect or deter domestic violations of laws and treaties involving fisheries. 1.C. Provide support for other agencies participating in fisheries law enforcement in those areas for which the Coast Guard shares statutory responsibility or has enforcement authority. 1.D. Increase the enforcement capabilities of patrol units through the application of technological advances and the assignment of law enforcement and language-trained personnel.
2. Enforce federal laws and international agreements concerning the detection, prevention, and suppression of crimes on vessels and in waters subject to U.S. jurisdiction, except those related to living and non-living resources, pollution, traffic control, and port and vessel safety.	2.A. Detect or deter 75 percent of the violations of federal laws and international agreements relating to illicit trafficking in narcotics and psychotropic substances. 2.B. Detect or deter an optimum level of violations of federal laws and treaties other than those related to drugs, fisheries, non-living resources or those pertaining to other Coast Guard programs. 2.C. Cooperate with other agencies engaged in maritime law enforcement in those areas for which Coast Guard shares statutory responsibility or has enforcement authority. 2.D. Increase the capabilities of patrol units through the appication of technological advances and assignment of trained law enforcement personnel.
3. Enforce federal laws and international agreements relating to non-living natural resources.	3.A. Identify Coast Guard responsibilities and activity levels required for non-living resource enforcement. 3.B. Detect or deter violations of law and treaties relating to non-living resources.
4. Prevent loss of life and property resulting from the hijacking and theft of vessels.	4.A. Minimize hijacking through early investigation of overdue or missing vessel cases, prosecution of known hijackings, and dissemination of preventative measures to the boating public. 4.B. Minimize the occurrence of vessel thefts through Coast Guard participation in the processing of stolen vessel incidents.
5. Prevent the loss of marine gear resulting from the interference between fixed and mobile gear users.	5.A. Minimize the deployment of fixed and mobile gear in common areas simultaneously. 5.B. Respond to reports of gear conflicts.
6. Prevent loss of life, personal injury and property damage resulting from civil craft loitering in prescribed maritime danger areas.	6.A. Minimize civil craft loitering in danger areas through the issuance of information and on-side education of mariners.

Goal	*Milestone*
7. Cooperate with other federal agencies and state and local law enforcement officials engaged in the performance of their duties, where the use of Coast Guard resources is in the public interest.	7.A. Respond to requests from other agencies for assistance in areas where the Coast Guard has no statutory obligations, but where the use of the unique capabilities of our resources and personnel are mutually beneficial. 7.B. Provide law enforcement support for the Trust Territories of the Pacific Islands (TTPI) as resources and operating schedules permit.

DISCUSSION

The principal and most concrete goal of the Coast Guard's current general law enforcement standards is the one relating to drug law enforcement. Agency officials take the position that it would require interdiction of from 60 to 75 percent of the marihuana being brought into the country by sea to produce a substantial economic impact on the traffic.[9] This hypothesis is based on the Coast Guard's assumption that if the drug traffickers' return on investment falls below the "threshold value" of 25 percent, they will turn to alternate investments. The conclusion that 75-percent interdiction is required to achieve the desired reduction in profit is based on a model, devised by the Coast Guard, that makes the following assumptions: (a) The quantity of marihuana shipped by sea remains constant. (b) The cost per unit of marihuana at the source remains constant. (c) The unit selling price of marihuana obtained by a trafficker remains constant. (d) There is no cost to the trafficker other than the acquisition cost of the marihuana shipped by sea. (e) The minimum rate of return on investment demanded by all traffickers is the same, and at a lesser rate of return on investment no marihuana will be shipped by sea.[10]

As is apparent, all of the above assumptions are subject to question. Further, as the Coast Guard acknowledges, the model fails to take into account any deterrence value that may be attached to interdiction efforts.[11]

The OMB reportedly has challenged the Coast Guard model on two grounds: First, the relationship of a 75-percent interdiction rate to economic impact on the illicit marihuana traffic has not been established by the Coast Guard's interdiction model, and second, that the real problem would be solved by Coast Guard interdiction at this level is an unjustifiable assumption. The OMB apparently believes, and Drug Enforcement Administration officials agree, that there are no sound reasons to think that achievement of a high interdiction rate by the Coast Guard would not (1) cause traffickers to shift to air and overland transport, which although

[9] Testimony of Adm. John B. Hayes, Commandant of the U.S. Coast Guard, before the House Subcommittee on the Coast Guard and Navigation, July 14, 1981. Unpublished transcript, p. 39.

[10] U.S. Coast Guard. "U.S. Coast Guard Military Personnel Requirements." Report to the Department of Transportation and the Office of Management and Budget. October 1980. Appendix XVI: Assessment of Impact of Resource Shortfall on Program Performance—Drug Enforcement, pp. XVI-8 and XVI-9.

[11] *Ibid.*, p. XVI-8.

more expensive would still yield substantial profits, and (2) stimulate domestic production.

If the OMB arguments are correct, a major—and presumably costly—success by the Coast Guard could result in a change in transport and production patterns but at the same time fail to have a lasting impact on the problem being addressed: The consumption of marihuana in the United States.

ACTUAL PERFORMANCE

With respect to the enforcement of drug laws, the Coast Guard estimates that it is currently interdicting between 10 and 20 percent of the total amount of illicit drugs coming in by sea, predominantly marihuana.[12] Since the agency's optimum goal is 75 percent interdiction, actual performance is approximately 60 percent below target. It is approximately 35 percent below the intermediate goal of 50 percent interdiction. The Coast Guard position is that its present interdiction rate is the best that can be achieved given available resources.

The following table indicates the growing dimensions of the Coast Guard's role in drug law enforcement since 1973:

GENERAL LAW ENFORCEMENT CONTRABAND SEIZURES BY FISCAL YEAR

	1973–76	1977	1978	1979	[1] 1980	[2] 1981
Marihuana seized by Coast Guard (thousands of pounds)	212	778	2,928	2,793	1,175	3,214
Marihuana seized by other agencies with CG participation (thousands of pounds)	134	111	286	272	279	662
Value of all drug contraband seized (millions of dollars)	$100	$272	$1,118	$1,699	$1,039	$2,786

[1] The 1980 data reflect the impact of the Coast Guard's Cuban refugee operations. They illustrate what can hapen to the agency's routine operations when an emergency involving national security arises.
[2] As of Sept. 28, 1981.
Source: U.S. Coast Guard.

COAST GUARD'S ASSESSMENT OF NEEDS

The Coast Guard estimates that the following additional capital investment [13] is needed to increase drug interdiction to the indicated levels from the present 10 to 20 percent: 50 percent—$1.5 billion; and 75 percent—$3.25 to $4 billion. Specifically, the higher level budget would be used to acquire the following additional resources: 42 medium-endurance cutters; 57 patrol boats; 38 medium-range fixed-wing aircraft; and 45 short-range recovery aircraft.[14] This assessment has not been subjected to cost-effectiveness or cost-benefit analyses, according to the OMB.

A large percentage of the Coast Guard's projected needs is based on the assumption that additional cutter time is the basic element of any increase in the level of interdiction. Much of the $1.75 bil-

[12] Coast Guard Commandant Admiral Hayes recently testified before the House Subcommittee on the Coast Guard and Navigation that the rate was from 14 to 18 percent. However, in answering questions, he stated that "nobody really knows" if this is an accurate estimate. Hearing, July 14, 1981. Unpublished transcript, p. 39.
[13] Acquisition, construction, and improvement (A.C. & I.) dedicated to drug law enforcement.
[14] List received informally from the Coast Guard's Office of Law Enforcement.

lion in added A.C. & I. funds considered necessary for optimum performance would be allotted to the purchase of new cutters, principally of the new 270-foot *Bear* class. However, questions have reportedly been raised by the OMB with respect to this heavy reliance on cutters in drug law enforcement.

In fiscal year 1979, the Coast Guard calculates that its cutters spent 43,000 hours on drug law enforcement and that patrol boats spent 58,000 hours. The cutters seized twice as much marihuana as the patrol boats, but were considerably more costly to operate. In 1979, the average operating cost of a cutter (210 feet and over) was $2.3 million, the cost of a patrol boat approximately $260,000 in the case of the 95-footer and $192,000 in the case of an 82-footer.[15]

In addition to being considerably more expensive to operate, cutters represent a far greater capital investment. According to current informal OMB estimates, a *Bear* class cutter costs in the range of $80 million, while patrol boats cost in the range of $7 million to $12 million.

The OMB apparently believes the Coast Guard should reconsider its current operating procedures, and its assessment of additional resources needed, in terms of the relative cost-benefit and cost effectiveness of cutters and patrol boats. The Coast Guard's Operational Law Enforcement Division says it has prepared a detailed justification of cutter use for the enforcement function, but the document has not received official approval and was not available for purposes of this analysis. Presumably, OMB believes that more operations could take place in waters where the smaller craft could be used.[16]

Proposals To Reduce or Reassign Coast Guard Responsibility

The principal concern of the Coast Guard's general law enforcement function in recent years has been the interdiction of marihuana originating in Latin America, for the most part in Colombia. There seems to be a consensus that given our present national policy on marihuana, which relies in large degree on interdiction, and given the continued need of traffickers to transport by ship, the Coast Guard role in drug law enforcement is indispensable. However, there are many who advocate a greater use of U.S. Navy resources in the conduct of this mission. Legislation recently passed by Congress[17] specifically authorizes the Armed Services to participate, in limited fashion, in the enforcement of laws controlling dangerous drugs. The question of how the cost of such participation would be budgeted remains to be settled. (See Addendum, p. 49 for a discussion of this proposal and its relation to the Posse Comitatus Act of 1878.) As far as can be determined, there are no estimates of the degree to which Navy or other Armed Service assistance would reduce pressure on the Coast Guard.

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[15] Assuming an average PB operating cost of $225,000 per year, the operating cost of the cutters in 1979 for drug law enforcement (seizing twice as much marihuana as PB's) was 7.5 times greater than that of the PBs. Amortization of A.C. & I. costs could increase the differential considerably.

[16] One suggestion reportedly made by OMB is that patrol boats could be used on the high seas, in the "choke point" areas, in conjunction with a "mother ship" such as an icebreaker.

[17] P.L. 97-86 (S. 815), Department of Defense authorization for appropriations for fiscal year 1982.

The point has frequently been made that interdiction is the least efficient and most difficult component of any drug control stategy. Coast Guard Commandant Adm. John B. Hayes has testified to this effect on a number of occasions. The alternatives are (1), reduction of demand, through education and other prevention measures; (2), reduction of production; and (3), legalization.

Legalization of marihuana does not appear to be a real option at the present time; not only does the American public show little evidence of support for such a move, but many respected authorities on drug abuse counsel against it. As for education and prevention measures, both Government and private programs have been in effect for a number of years. Assessments of the value of these efforts are mixed, and it is generally acknowledged that demonstrable gains can be slow to materialize. In the meantime, the market for marihuana in the United States apparently continues to grow.[18]

The U.S. Government has actively pursued the third alternative, a reduction in world marihuana production, for many years. Both domestically and abroad, eradication programs have been supported or encouraged. Under the Foreign Assistance Act, the internationl narcotics control (INC) program provides both financial and technical assistance for eradication and for crop substitution programs. However, in recent years eradication efforts were retarded by a provision enacted into law in 1978, the "Percy Amendment," which prohibited the use of INC funds for an eradication program using any herbicide harmful to human beings. The principal effect of the provision was to halt the financing of marihuana eradication programs that use the herbicide paraquat.

In the recently enacted bill authorizing fiscal year 1982 appropriations for foreign assistance, Congress in effect repealed the Percy Amendment, thus opening the way for resumption of marihuana eradication programs using paraquat.[19]

Supporters of the paraquat measures maintain that the Government of Colombia would take advantage of this assistance and that such a program could produce results similar to those of the Mexican eradication programs in effect since 1975.[20] However, at the present time the intentions of the Colombian government of President Julio Cesar Turbay are not, in the view of the Drug Enforcement Administration, all that clear. Moreover, elections will be held in Colombia next year, and the position of a new administration cannot be predicted. As regards the other current principal source, Jamaica,[21] it is also not certain that the Government would undertake an eradication effort, but supporters of repeal of

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[18] The most recent National Survey on Drug Abuse, conducted in 1979 by the Social Research Group at George Washington University and the Response Analysis Corp. in Princeton, shows that between 1972 and 1979 experience with marihuana (and cocaine) doubled among 12- to 17-year-olds and among those over 25 years of age. Between ages 18 and 25, the percentage of marihuana use increased from 48 percent to 68 percent. However, among the 12- to 17-year-olds current use showed signs of stabilization in 1979, with no increase over 1977 reported.

[19] P.L. 97-113 (S. 1196), International Security and Development Cooperation Act of 1981.

[20] Mexico, prior to 1975 the principal source of marihuana coming into the United States from abroad, accounted for only 12 percent in 1979. (National Narcotics Intelligence Consumers Committee. "The Supply of Drugs to the U.S. Illicit Market from Foreign and Domestic Sources in 1979." [U.S. Drug Enforcement Administration, 1981?], p. 31.)

[21] Estimated to account for 8 percent of the import market in 1979.

the Percy Amendment apparently believe that no other producing country could take the place of Colombia and Mexico.

If repeal of the amendment were in fact to result in a major disruption of the marihuana traffic, it is possible that the drug law enforcement segment of the Coast Guard's ELT missions could return to a pre-1977 level, which is to say cne of relatively minor significance. Such a development would obviously ease some of the agency's budgetary pressure, although to what degree is a matter of dispute.

FISHERIES ENFORCEMENT*

Statutory Basis

The Coast Guard is responsible for the enforcement of all Federal laws on the high seas and navigable waters of the United States and its possessions (14 U.S.C. 2, 89). Major fisheries enforcement duties are specified in section 311 of the Magnuson Fishery Conservation and Management Act (MFCMA) of 1976 (Public Law 94-265, 16 U.S.C. 1861 et seq.). This authority is shared with the Department of Commerce where enforcement activities are conducted by personnel of the National Marine Fisheries Service (NMFS).

In addition, the Coast Guard enforces a number of international fisheries agreements to which the United States is a party, such as the Convention for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea; the Convention for the Protection, Preservation, and Extension of the Sockeye and Pink Salmon Fisheries of the Fraser River System; and the International Convention for the High Seas Fisheries of the North Pacific Ocean. Coast Guard enforcement of the terms of these fisheries agreements predates the more recent responsibilities granted under MFCMA authority.

Capital Plant and Manpower Currently Allocated to the Program

The following table displays actual vessel and aircraft time committed to fisheries enforcement for the first 6 months of fiscal year 1981. To obtain estimated totals for the entire fiscal year 1981, effort levels for the final 5 months of the second half of the fiscal year were reduced to account for a May through September 1981 decrease to 80 percent of previous effort in the Pacific and 20 percent of previous effort in the Atlantic.[1] Effort expended in fisheries enforcement is normally higher during the second half of each fiscal year since this time period includes the summer months.

FISCAL YEAR 1981

	Aircraft hours		Vessel hours	
	Atlantic	Pacific	Atlantic	Pacific
First 6 months (actual)	553	1,928	7,989	8,894
Entire year (estimated)	853	3,971	11,362	22,816

* Prepared by Eugene H. Buck, specialist in natural resources policy, Environment and Natural Resources Policy Division.

[1] Actual and estimated aircraft and vessel hour statistics for fiscal year 1981 provided by Comdr. B. F. Thomson III, Chief, Fisheries Law Enforcement Branch, U.S. Coast Guard.

Performance Standards

Program standards for fisheries enforcement were developed as an adjunct to the budgetary process by the Coast Guard in consultation with the NMFS. Under the main goal, "Enforce Federal laws and international agreements relating to living resources, particularly fisheries and marine mammals," four milestones are listed. These are: First, detect or deter 95 percent of the foreign violations of laws and treaties involving fisheries; second, detect or deter 95 percent of the domestic violations of laws and treaties involving fisheries; third, provide support for other agencies participating in fisheries law enforcement in those areas for which the Coast Guard shares statutory responsibility or has enforcement authority; and fourth, increase the enforcement capabilities of patrol units through the application of technological advances and the assignment of law enforcement and language-trained personnel.

In addition, field guidelines exist which establish goals for fisheries enforcement on foreign vessels. They include: First, sight 90 percent of the foreign fishing vessels (FFV) within the U.S. fishery conservation zone (FCZ) during each 2-week period; and second, board each FFV within the FCZ on an average of once every 90 days.[2] There are no guidelines for fisheries enforcement action on domestic fishing vessels.

These standards have been challenged on two points. Domestic challenges—not from the U.S. fishing industry—have been of a fiscal nature asserting that 95 percent enforcement of both foreign and domestic fishing regulations is excessive from the standpoint of resources required to achieve this level. Representatives of foreign nations fishing in the FCZ have challenged the necessity of the continued "harassment" of FFV's by U.S. fisheries enforcement activities stating that their compliance with U.S. regulations would occur without the large enforcement effort.

The Coast Guard maintains, in light of the continued significant rate of violations detected during boardings, that a 95-percent enforcement rate is required to protect the resource.

Attainment of Performance Standards

The Coast Guard acknowledges only a subjective measure of their attainment of the 95-percent enforcement goal. Their best "guess" is that enforcement efforts currently deter or detect from 50 to 75 percent of all domestic and foreign violations.

An independent analysis states that the use of measures of performance similar to the first two program standards, to detect or deter 95 percent of the foreign and domestic violations, is thwarted by an inability to determine the tendency to violate in the absence of enforcement.[3] Thus, Young believes that such measures "can do no more than indicate tendencies, and in any case they (any tendencies to violate) may be offset in specific situations by countervailing forces like efforts to socialize fishermen regarding regula-

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[2] Along the Washington, Oregon, and California coasts (where fewer FFV's fish), this guideline has been altered to boardings once every 30 days.

[3] Young, Oran R. "Natural resources and the state: the political economy of resource management." Berkeley, University of California Press, 1981. Chapter 4. Enforcing public regulations: The Fishery Conservation and Management Act of 1976.

tions or the nature of the command structure within individual fishing companies." Similarly, he argues: "To the extent that violations are not detected by the enforcement program associated with a system of regulations, it follows that we can have no direct knowledge of their occurrence * * * it is relatively easy to violate specific regulations out of sight of any onlookers, and opinions concerning this issue once again vary greatly on the basis of personal worldview at least as much as on the basis of pertinent evidence." Thus, Young's conclusion concerning the usefulness of such a measure of effectiveness is that it is "as hard to use to good effect in practice as it is simple and straightforward in principle."[4]

The field guidelines, however, are more amenable to quantification. The Coast Guard approached its guideline but failed to sight 90 percent of the FFV's each 2-week period in the Alaska district in 17 of 20 months between October 1977 and May 1979. The attainment of this guideline is very sensitive to competing Coast Guard responsibilities such as search and rescue (SAR), and to poor weather conditions.[5]

For the second guideline—all FFV's boarded an average of once every 90 days, Coast Guard statistics indicate an average of 14 percent of the FFV's in the FCZ were boarded each month in calendar year 1979. This average declined to 11 percent in calendar year 1980. This approximates a boarding of each vessel once every 214 days in 1979 and once every 273 days in 1980.

Primary criticism of nonattainment of standards or guidelines for enforcement against foreign fishing vessels has come from the domestic fishing industry in each coastal region. The domestic industry feels that the resource is not being adequately protected from alleged foreign violations. Such criticism has been expressed by some Members of Congress from coastal districts.

Coast Guard Assessment of Needs

Estimates for 1985 illustrate the Coast Guard's best estimate of future resources required to achieve current program standards in fisheries enforcement. This estimate is predicated upon the assumption that all fishery management plans anticipated in the February 1980 "Joint National Marine Fisheries Service—United States Coast Guard Fisheries Enforcement Study" will be implemented by this time. A total requirement of 8,022 aircraft hours and 95,784 vessel hours is projected to attain 95 percent enforcement of both domestic and foreign fishing regulations in the FCZ in 1985.

Several major issues will affect the accuracy of these estimates of fisheries enforcement resource requirements. The anticipated regulation of additional fisheries under fishery management plans (FMP's) will mean new foreign fisheries in the FCZ to be enforced. In addition, some FMP's will implement Federal regulations for domestic fisheries where little foreign fishery activity previously had to be monitored. These actions will necessitate new Coast Guard enforcement duties, such as occurred recently in the Gulf of Mexico

[4] Ibid., draft of chapter 4, pp. 28–29.
[5] Ibid., draft of chapter 4, pp. 15–17.

following the implementation of the FMP for shrimp. If tuna should cease to be excluded from MFCMA management, the enforcement burden will increase tremendously. This eventuality is not included in the 1985 projections of enforcement resources required. Specifically, the western Pacific portion of the FCZ will require considerable resources to enforce any tuna management plan since little enforcement activity currently is conducted in these waters.

If, and when, a 100-percent observer program is begun for all foreign vessels fishing in the FCZ, the Coast Guard anticipates an increase in "calls for help" from observers who find various problems with their accommodations, such as personal security and safety, which may not relate directly to fisheries enforcement.

As foreign fishing is progressively displaced from the FCZ, the Coast Guard anticipates a concurrent increase in grossly illegal incursions into the FCZ for surreptitious fishing. This has already happened in the Kure Island area northwest of Hawaii with coral draggers. This will place an additional burden on Coast Guard resources.

These estimates of future needs have not been challenged substantially since they are new and have not been widely publicized or known.

Proposals To Reduce or Reassign Coast Guard Responsibility

There are no proposals. However, the Coast Guard has negotiated at least 17 memorandums of understanding with various coastal jurisdictions and cooperating Federal agencies (12 States, the Trust Territory of the Pacific Islands, the DOD, and the NMFS) to expand enforcement coverage and coordinate offshore efforts with dockside and inshore activities.

ADDENDUM

INTERDICTION OF ILLEGAL ALIENS (HAITIAN INTERDICTION PROGRAM)*

The administration announced on September 29, 1981, a program for interdiction of vessels transporting undocumented Haitian aliens to the United States. Authority for such a program, according to the Department of Justice, is based on the President's constitutional role in foreign relations—article II—and on his statutory authority to forbid the entry of certain classes of aliens determined to be detrimental to the interests of the United States (8 U.S.C. 1182(f)).

The program began in October 1981 as a 3-month experiment with the Coast Guard, under its general authority to enforce Federal laws on the high seas and in waters subject to U.S. jurisdiction, having the major interdiction role. Coast Guard vessels are authorized to stop and board Haitian-flag vessels to determine whether Haitian nationals on board are being transported in violation of the law and whether they have requisite entry documents for their

*Prepared by Sharon Masanz, analyst in social legislation, Education and Public Welfare Division.

country of destination; and to return persons in violation of the laws to Haiti. Examination of Haitian nationals is to be accomplished with the assistance of Immigration and Naturalization Service officers.

The interdiction program will initially require one full-time cutter; two short-range recovery helicopters; and 5 flight hours per day of fixed-wing aircraft coverage. The Coast Guard estimates that approximately 42 personnel will augment the crew required for the cutters and aircraft. The cost is estimated to be about $1 million per month.

The Coast Guard's participation in the program has been criticized as possibly presenting a negative image of the Coast Guard to other countries. This criticism is based on the possibility that the program will be perceived as discriminatory by other countries and by the concern that the legal authorities for the program are questionable. The Coast Guard's participation has also been censured on the grounds that the additional responsibilities may be a drain on Coast Guard resources. Administration spokesmen maintain that the program is necessary to halt the flow of approximately 1,500 undocumented Haitians per month to the United States. They have also suggested that the program may save the lives of some Haitians undertaking the voyage in dangerous vessels.

THE LEGAL STATUS OF MILITARY PERSONNEL ACTING IN A LAW ENFORCEMENT CAPACITY: POSSE COMITATUS ACT RESTRICTIONS ON THE COAST GUARD IN TIME OF PEACE AND IN WAR†

Issue Definition

The Posse Comitatus Act limits the extent to which military forces may legally be used to "execute the laws." There is little question that the Coast Guard is exempt from application of the Posse Comitatus language, despite the fact that it is considered a "military force" at all times. The Navy, while not specifically restricted by the language of the act, has by directive limited its law enforcement role in order to be in conformity with the Federal policy as it applies to the other services. Since the Coast Guard would pass under control of the Secretary of the Navy during wartime, would Posse Comitatus restrict Coast Guard law enforcement activities during wartime?

Background

The Posse Comitatus Act (18 U.S.C. 1385) provides:

> Whoever, except in cases and under circumstances expressly authorized by the Constitution or Act of Congress, willfully uses any part of the Army or the Air Force as a posse comitatus or otherwise to execute the laws shall be fined not more than $10,0000 or imprisoned not more than two years, or both.

The act, in slightly different form, first became law in 1878 (20 Stat. 152). Enacted during the Reconstruction period, it had as its immediate objective prohibition of the use of Federal troops to police State elections in the formerly Confederate States where the

†Prepared by Kent M. Ronhovde, legislative attorney, American Law Division Nov. 2, 1981.

civil power had been reestablished. Objection had also been voiced over the use of troops to collect taxes, maintain order during strikes, and to assist local marshals in carrying out their work.

As orginally proposed, the act would have applied to "any part of the land or naval forces of the United States," 7 Congressional Record 3586 (1878). It was finally enacted as a rider to an Army appropriations bill, however, and only that branch of the service was mentioned in the final version. In 1956, when the Posse Comitatus Act was inserted into title 18 of the United States Code, the Air Force was added to its coverage, reflecting the separation of those services (7-A Stat. 626). The Department of the Navy—the Navy and the Marines—has to date not been added. However, the Navy has adopted the restrictions of the act as a statement of public policy. See SECNAVINST 5820.7 of May 15, 1974. Acceptance of the act's prohibition can therefore arguably be rescinded by amendment or withdrawal of the Secretary's Instructions. See answers supplied by the Commandant of the U.S. Coast Guard, "Coast Guard Authorization, Reserve, and Oversight," hearings before the Committee on Merchant Marine and Fisheries of the House of Representatives, 96th Congress, 2d session, 246 (1980).

The Coast Guard was formally established in 1915 as "a part of the military forces of the United States." (38 Stat. 800). Section 1 of title 14 of the United States Code today provides that it "shall be a military service and a branch of the armed forces of the United States at all times." While the Coast Guard is a service within the DOT during peacetime, 14 U.S.C. 3 provides that "[u]pon declaration of war or when the President directs, the Coast Guard shall operate as a service in the Navy, and shall so continue until the President, by Executive order, transfers the Coast Guard back to the DOT." The section also stipulates that while it acts as a service of the Navy, the Coast Guard "shall be subject to the orders of the Secretary of the Navy who may order changes in Coast Guard operations to render them uniform, to the extent he deems advisable, with Navy operations."

During peacetime it would appear that not only is the Coast Guard not covered by the Posse Comitatus Act, but its statutory authorization to perform law enforcement functions is sufficient to exempt it from most of the act's restrictions. The Congress has provided, for example, that the Coast Guard "may make inquiries, examinations, inspections, searches, seizures, and arrests upon the high seas and waters over which the United States has jurisdiction, for the prevention, detection, and suppression of violations of laws of the United States." (14 U.S.C. 89). And when so doing, Coast Guard officers are "deemed to be acting as agents of the particular executive department or independent establishment charged with the administration of the particular law." (Id.) And legislation also stipulates that the Coast Guard may, when requested by proper authority, "utilize its personnel and facilities to assist any Federal agency, State, territory, possession, or political subdivision thereof, or the District of Columbia, to perform any activity for which such personnel and facilities are especially qualified." (14 U.S.C. 141.)

In *Jackson* v. *State*, 572 P. 2d 87 (Alaska Sup. Ct. 1977), the only case we have found which addresses directly the question of applicability of posse comitatus restrictions to the Coast Guard, the

Alaska Supreme Court dealt with a motion to dismiss a drug charge on grounds of asserted Posse Comitatus Act violations. An informant in the case was a corpsman of the Coast Guard. In concluding that the act was not intended to cover the Coast Guard, the court said:

> First, we think a reading of the text leads to the conclusion that the Posse Comitatus Act applies only to the Army and the Air Force. Second, the legislative history of the Act indicates that Congress intended to limit the coverage of the Act to the Army and the Air Force. The fact that Congress avoided explicitly including the naval forces or the Coast Guard when the Posse Comitatus Act was passed and in [a] proposed 1974 amendment [to criminal code reform legislation] which died in committee weighs heavily in our conclusion that the Coast Guard is not within the ambit of the Act. Similarly, the law enforcement role established for the Coast Guard by Congress indicates that Congress did not intend to make the Posse Comitatus Act applicable to the United States Coast Guard. (at 93).

The court held that "[g]iven the unique dual organizational character of the Coast Guard and the various specific statutory mandates requiring it to enforce certain laws and regulations, we conclude that it would be inappropriate to construe the Posse Comitatus Act as applying to the United States Coast Guard." (Id.)

During wartime the Coast Guard would become subject to whatever restrictions the act places upon the Navy. The Secretary of the Navy's instruction includes the policy statement that "[a]lthough not expressly applicable to the Navy and Marine Corps, the Posse Comitatus Act * * * is regarded as a statement of Federal policy which is closely followed by the Department of the Navy." The instruction orders that "[members] of the naval service shall not, in their official capacity, enforce or execute local, State, or Federal civil laws except in the following cases: (a) when expressly authorized by the Constitution or Act of Congress; (b) when authorized under the provisions of [SECNAVINST 5400.12 of January 17, 1969 re: civil disturbances]; or (c) when specific approval of the Secretary of the Navy is granted." In *United States* v. *Walden*, 490 F. 2d 372 (4th Cir.), cert. denied, 416 U.S. 983 (1974), the Fourth Circuit, relying on a 1969 instruction of the Secretary to the same effect, held that "though by its terms the Posse Comitatus Act does not make criminal the use of Marines to enforce Federal law, the Navy has adopted the restriction by self-imposed administrative regulation." (At 374.) After finding that the legislative history of the act "reveals a policy applicable to all of the armed services," the court suggested a constitutional dimension to the question: "The policy that military involvement in civilian law enforcement should be carefully restricted has deep roots in American history. * * * In the congressional debate on the Posse Comitatus Act, several Senators expressed the opinion that the Act was no more than an expression of constitutional limitations on the use of the military to enforce civil laws." (At 375.) The Supreme Court has also stressed the "deep roots" in our history which resist military intrusion into civilian affairs. *Laird* v. *Tatum*, 408 U.S. 1, 15 (1972). The court in *Walden* found it unnecessary to reach the constitutional standard, relying instead on the Secretary's instruction to find the Navy bound by posse comitatus restrictions. But it did so adding that its interpretation of the scope of the act was "influenced by the traditional American insistence on exclusion of the

military from civilian law enforcement, which some have suggested is lodged in the Constitution." (490 F. 2d, at 376.)

It has recently been suggested that naval resources can be utilized to deal with the drug problem, the Posse Comitatus Act notwithstanding. Section 873(b) of title 21 of the United States Code, a provision of the Comprehensive Drug Abuse Prevention and Control Act of 1970 (84 Stat. 1242), states that "[w]hen requested by the Attorney General, it shall be the duty of any agency or instrumentality of the Federal Government to furnish assistance, including technical advice, to him for carrying out his functions under this subchapter. * * *" While the Posse Comitatus Act restrictions would likely take precedence over this general assistance provision, it is arguable that the Navy's instruction alone would not bar assistance. See "Final Report of Attorney General's Task Force on Violent Crime" of August 17, 1981, phase I, recommendation 2. Indeed, it has been reported that the Justice Department has already expressed its intention to use naval forces as part of the administration's border policy. (The Washington Post, October 18, 1981, at A12.)

It is also arguable, however, on the basis of present law, the Constitution, or Navy regulation, that upon declaration of war the Coast Guard would become subject to Posse Comitatus Act proscriptions. Its authority to act in areas statutorily authorized would remain unimpaired. But it remains uncertain whether Coast Guard involvement in law enforcement activity outside of that sphere would subject individuals to criminal liability or result in the exclusion of evidence deemed necessary for successful prosecution of indicted persons.

The limited number of cases reported under the act have suggested varying standards as to the point at which military "assistance" becomes sufficient to constitute a violation of the act. Whether "direct active use" of military personnel is required, or use of the Armed Forces in a manner which "pervades the activities," or whether "subjecting citizens to the exercise of military power which is regulatory, proscriptive, or compulsory in nature" is the test used—the restriction has the potential for hampering law enforcement operations in which military personnel are involved. Absent legislative change, the wartime Coast Guard might not be immune from imposition of these standards. See *United States* v. *McArthur,* 419 F. Supp. 186 (D.N.D.), aff'd. sub nom. *United States* v. *Casper,* 541 F. 2d 1275 (8th Cir. 1976), cert. denied, 430 U.S. 970 (1977). See also, *United States* v. *Hartley,* 486 F. Supp. 1348 (M.D. Fla. 1980); *United States* v. *Wolffs,* 594 F. 2d 77 (5th Cir. 1979); *United States* v. *Red Feather,* 392 F. Supp. 916 (D.S.D. 1975); *Wrynn* v. *United States,* 200 F. Supp. 457 (E.D.N.Y. 1961); *United States* v. *Jaramillo,* 380 F. Supp. 1375 (D. Neb. 1974), appeal dismissed, 510 F. 2d 808 (8th Cir. 1975); *Chandler* v. *United States,* 171 F. 2d 921 (1st Cir. 1948), cert. denied, 336 U.S. 918 (1949); *United States* v. *Banks,* 383 F. Supp. 368 (D.S.D. 1974).

Options for the Congress

The Congress has in the past created specific exceptions to the Posse Comitatus Act for certain crimes, for example, for investiga-

tion of Presidential or congressional assassination, see 18 U.S.C. 351, 1751. The 97th Congress has passed legislation designed to clarify permissible roles of the military in the area of law enforcement—especially in the interdiction of illegal drug traffic.[1] This somewhat controversial legislation passed the Senate and House in different form and was resolved in conference—the final language differing significantly from the proposals passed by the two bodies prior to conference. The posse comitatus provisions were included in the authorization legislation for fiscal 1982 military procurement programs, S. 815. Controversy over the measure focused largely upon proposals to grant authority to Armed Forces personnel to participate in search and seizure or arrest activities. As described in the conference report (H. Rept. No. 97-311), the legislation "establishes a new chapter in Part I, subtitle A of Title 10, United States Code, to authorize certain military cooperation with civilian law enforcement officials. The new chapter—chapter 18—would contain eight sections which (1) permit various forms of military assistance to civilian law enforcement officials, (2) restrict the direct participation of military personnel in law enforcement activities, (3) require that furnishing assistance not adversely affect military preparedness, (4) provide for reimbursement for assistance to civilian authorities, and (5) make clear that the chapter does not limit the authority granted by existing law." The legislation, as approved by both Houses, provides as follows:

"CHAPTER 18—MILITARY COOPERATION WITH CIVILIAN LAW ENFORCEMENT OFFICIALS

"Sec.
"371. Use of information collected during military operations.
"372. Use of military equipment and faciliities.
"373. Training and advising civilian law enforcement officials.
"374. Assistance by Department of Defense personnel.
"375. Restriction on direct participation by military personnel.
"376. Assistance not to affect adversely military preparedness.
"377. Reimbursement.
"378. Nonpreemption of other law.

"§ 371. Use of information collected during military operations

"The Secretary of Defense may, in accordance with other applicable law, provide to Federal, State, or local civilian law enforcement officials any information collected during the normal course of military operations that may be relevant to a violation of any Federal or State law within the jurisdiciton of such officials.

"§ 372. Use of military equipment and facilities

"The Secretary of Defense may, in accordance with other applicable law, make available any equipment, base facility, or research facility of the Army, Navy, Air Force, or Marine Corps to any Federal, State, or local civilian law enforcement official for law enforcement purposes.

"§ 373. Training and advising civilian law enforcement officials

"The Secretary of Defense may assign members of the Army, Navy, Air Force, and Marine Corps to train Federal, State, and local civilian law enforcement officials in the operation and maintenance of equipment made available under section 372 of this title and to provide expert advice relevant to the purposes of this chapter.

[1] The report of the conference committee is reproduced in the Congressional Record (daily edition) of Nov. 3, 1981, at H7957.

"§ 374. Assistance by Department of Defense personnel

"(a) Subject to subsection (b), the Secretary of Defense, upon request from the head of an agency with jurisdiction to enforce—

"(1) the Controlled Substances Act (21 U.S.C. 801 et seq.) or the Controlled Substances Import and Export Act (21 U.S.C. 951 et seq.);

"(2) any of sections 274 through 278 of the Immigration and Nationality Act (8 U.S.C. 1324-1328); or

"(3) a law relating to the arrival or departure of merchandise (as defined in section 401 of the Tariff Act of 1930 (19 U.S.C. 1401)) into or out of the customs territory of the United States (as defined in general headnote 2 of the Tariff Schedules of the United States (19 U.S.C. 1202)) or any other territory or possession of the United States, may assign personnel of the Department of Defense to operate and maintain or assist in operating and maintaining equipment made available under section 372 of this title with respect to any criminal violation of any such provision of law.

"(b) Except as provided in subsection (c), equipment made available under section 372 of this title may be operated by or with the assistance of personnel assigned under subsection (a) only to the extent the equipment is used for monitoring and communicating the movement of air and sea traffic.

"(c)(1) In an emergency circumstance, equipment operated by or with the assistance of personnel assigned under subsection (a) may be used outside the land area of the United States (or any territory or possession of the United States) as a base of operations by Federal law enforcement officials to facilitate the enforcement of a law listed in subsection (a) and to transport such law enforcement officials in connection with such operations, if—

"(A) equipment operated by or with the assistance of personnel assigned under subsection (a) is not used to interdict or to interrupt the passage of vessels or aircraft; and

"(B) the Secretary of Defense and the Attorney General jointly determine that an emergency circumstance exists.

"(2) For purposes of this subsection, an emergency circumstance may be determined to exist only when—

"(A) the size or scope of the suspected criminal activity in a given situation poses a serious threat to the interests of the United States; and

"(B) enforcement of a law listed in subsection (a) would be seriously impaired if the assistance described in this subsection were not provided.

"§ 375. Restriction on direct participation by military personnel

"The Secretary of Defense shall issue such regulations as may be necessary to insure that the provision of any assistance (including the provision of any equipment or facility or the assignment of any personnel) to any civilian law enforcement official under this chapter does not include or permit direct participation by a member of the Army, Navy, Air Force, or Marine Corps in an interdiction of a vessel or aircraft, a search and seizure, arrest, or other similiar activity unless participation in such activity by such member is otherwise authorized by law.

"§ 376. Assistance not to affect adversely military preparedness

"Assistance (including the provision of any equipment or facility or the assignment of any personnel) may not be provided to any civilian law enforcement official under this chapter if the provision of such assistance will adversely affect the military preparedness of the United States. The Secretary of Defense shall issue such regulations as may be necessary to insure that the provision of any such assistance does not adversely affect the military preparedness of the United States.

"§ 377. Reimbursement

"The Secretary of Defense shall issue regulations providing that reimbursement may be a condition of assistance to a civilian law enforcement official under this chapter.

"§ 378. Nonpreemption of other law

"Nothing in this chapter shall be construed to limit the authority of the executive branch in the use of military personnel or equipment for civilian law enforcement purposes beyond that provided by law prior to the enactment of this chapter.".

(2) The tables of chapters at the beginning of subtitle A of such title and at the beginning of part I of subtitle A of such title are amended by adding after the item relating to chapter 17 the following new item:

"18. Military Cooperation with Civilian Law Enforcement Officials 371".

(b) Not later than 30 days after the end of the 180-day period beginning on the date of the enactment of this Act, the Secretary of Defense shall submit a comprehensive report to Congress on the operation through the end of such period of chapter 18 of title 10, United States Code (as added by subsection (a)). Such report shall include findings of the Secretary concerning the effect of assistance provided under such chapter.

While the peacetime Coast Guard may not be in need of legislation clarifying its posture in regard to the act, the wartime role of the Coast Guard is less clear when "execution of the laws" is at issue. The legislation passed by the 97th Congress significantly clarifies that wartime role by authorizing naval forces to assist civilian law enforcement agencies within defined limits. Whether these limits are the appropriate ones remains a matter for future consideration. Subsection (b) of section 378, as passed, requires the Secretary of Defense to report to the Congress on the effect of the assistance authorized by the law. Of this report the conference report states: "The assistance of the military authorized by this chapter will be used primarily by the United States Department of Justice, the Coast Guard and the Customs Service. Thus, the conferees expect that the Secretary of Defense will include within this report the views of the Attorney General, the Commandant of the Coast Guard and the Secretary of the Treasury. In addition, in order to assess the relative importance of the assistance rendered by the military, the conferees expect that the report will address the desirability of expanding or contracting the scope of the assistance authorized by this chapter." Thus it remains to be seen whether this legislation will significantly assist the peacetime Coast Guard in performing its duties by allowing it to tap limited military resources. And the extent of restrictions applying to the Coast Guard in wartime, while arguably reduced, remains unclear.

PORT AND ENVIRONMENTAL SAFETY PROGRAM*

Basis for the Responsibility

The port and environmental safety program (PES) represents three important Goast Guard activities in port safety, port security, and environmental protection responsibilities.[1] Port safety and security has been an important function of the captain of the port (COTP) since 1915. During World Wars I and II, the captains of the port insured the safe movement and guaranteed security of military and economic shipping. Environmental protection responsibilities are an outgrowth of public concern over potential hazards posed by marine transportation.

Coast Guard officers have served as captains of the port based on the Espionage Act of 1917 (50 U.S.C. 191). The COTP, at that time, was responsible for the enforcement of anchorage regulations, the handling of explosives on waterborne vessels, and the control of vessel movements in ports and anchorages. These responsibilities were continued and expanded to include the provision of security from port sabotage or subversion during World War II. Various Executive orders and wartime legislation codified the COTP's responsibilities in the provision of security in the port areas. The COTP was instructed to prevent damage from sabotage, subversion, and accidents. Thus, by the end of World War II, the COTP was expected to protect the ports, harbors, vessels, piers, docks, and waterfront facilities; control the movement and anchorage of vessels; control the handling of dangerous cargoes, and monitor the movement of special interest vessels.

Prior to 1972, all of these port safety/security functions of the COTP were underwitten by legislation and/or Executive orders that could have been rescinded by the President. There was no statute which established the port safety and security missions as a permanent Coast Guard function. However, in the early 1970's, the Congress provided significant legislative authority for the COTP's port safety, port security, and marine environmental protection missions. The Ports and Waterways Safety Act of 1972, Public Law 92-340, established an initial framework for the Coast Guard's statutory obligation to prevent damage, destruction, or loss of any vessel or structure in or adjacent to U.S. navigable waters. The Port and Tanker Safety Act of 1978, Public Law 95-474, broadened the COTP's authority by defining the marine environment to include the 200-mile fishery management zone and the waters over the Outer Continental Shelf. The COTP is also responsible for regulating the transport of hazardous materials through the port area.

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*Prepared by John Joseph Stocker, analyst in national defense, Foreign Affairs and National Defense Division.

[1] U.S. Department of Transportation. U.S. Coast Guard. "Port and Environmental Safety fiscal years 1983-92. Operating Program Plan." Washington, Dec. 8, 1980, p. IV-5.

This responsibility derives largely from the Hazardous Materials Transportation Act of 1975, Public Law 94-56, which superseded the Dangerous Cargo Act (46 U.S.C. 170, as amended), in regulating the transport of hazardous packaged cargoes. The transport of bulk cargoes is regulated by the Ports and Waterways Safety Act of 1972 and the Port and Tanker Safety Act of 1978. Flammable liquid cargoes are subject to the Tank Vessel Act (46 U.S.C. 391a). The COTP's responsibility for port security is largely based on the military preparedness requirement. There is a statutory requirement under title 14, United States Code, for the Coast Guard to serve as a ready force. Under this obligation, the COTP has specific responsibilities related to cargo and vessel movements and insuring the security of port and harbor operations during wartime. During peacetime, the COTP is required to prevent and/or respond to sabotage and terrorist acts in the ports and harbors of the United States. Marine environmental activities derive from a series of legislative initiatives including the Water Quality Improvement Act (1970), the Federal Water Pollution Control Act (1972 amendments), and the Clean Water Act of 1977.[2] These initiatives give the Coast Guard a major responsibility in the prevention of marine pollution, responding to polluting discharges, and the assessment of penalties.[3]

In addition to specific legislation and past practice, recent organizational changes have redefined the scope of the PES program. Prior to May 1, 1980, the Coast Guard had two separate programs: First, port safety and security (PSS), and second, marine environment program (MEP). With the reorganization of the Office of Marine Environment and Systems and the creation of the Office of Navigation, the old functions under the PSS and MEP programs were redefined along functional lines. The vessel traffic services and rules of the road functions were placed under the waterways management program. Responses to water pollution complaints were placed under the marine environmental response program. The remaining port safety, port security, and marine environmental protection responsibilities were placed under the port and environmental safety program (PES).

Thus, the captain of the port has defined functions under the PES program. He is "* * * to protect the safety of persons, vessels, structures and the quality of the marine environment including: Control of vessel movements and anchorages, development and enforcement of standards for the transfer of oil or hazardous substances, enforcement of standards for transportation of hazardous materials, development and enforcement of standards for waterfront facilities, and assessment of civil penalties for discharges of oil or hazardous substances."

Resources

The captains of the port are the primary Coast Guard organization responsible for performing functions identified under the PES

[2] "U.S. Coast Guard. Military Personnel Requirements. Report to the Department of Transportation and the Office of Management and Budget." Washington, October 1980. Appendix I. p. I-1.

[3] Operating program plan, p. IV-2.

program. There are currently 54 marine safety offices commanded by a captain of the port.

TABLE 1.—CAPTAIN OF THE PORT

Albany, N.Y.	Mobile, Ala.
Anchorage, Alaska	Monterey, Calif.
Baltimore, Md.	Muskegon, Mich.
Boston, Mass.	Nashville, Tenn.
Buffalo, N.Y.	New Haven, Conn.
Charleston, S.C.	New London, Conn.
Chicago, Ill.	New Orleans, La.
Cincinnati, Ohio	New York, N.Y.
Cleveland, Ohio	Paducah, Ky.
Corpus Christi, Tex.	Philadelphia, Pa.
Detroit, Mich.	Pittsburgh, Pa.
Duluth, Minn.	Port Arthur, Tex.
Galveston, Tex.	Portland, Maine
Guam	Portland, Oreg.
Hampton Roads, Va.	Providence, R.I.
Honolulu, Hawaii	San Diego, Calif.
Houston, Tex.	San Juan, P.R.
Humboldt Bay, Calif.	San Francisco, Calif.
Huntington, W. Va.	Sault Ste Marie, Mich.
Jacksonville, Fla.	Savannah, Ga.
Juneau, Alaska	St. Louis, Mo.
Los Angeles-Long Beach, Calif.	Seattle, Wash.
Louisville, Ky.	Sturgeon Bay, Wis.
Memphis, Tenn.	Tampa-St. Petersburg, Fla.
Miami, Fla.	Toledo, Ohio
Milwaukee, Wis.	Valdez, Alaska
Minneapolis, Minn.	Wilmington, Del.

Source: Code of Federal Regulations. Vol. 33, part 3, pp. 36–37.

The Marine Safety Office is a consolidation of two previously independent functions; the Marine Inspection Office and the Port Safety Station.[4]

In the fiscal year 1982 budget, the Coast Guard estimated the following workload profile for its port safety and environmental protection activities: [5]

	Workload data		
	1980 actual	1981 estimate	1982 estimate
Environmental protection:			
Aerial oil pollution patrols (employment hours)	12,000	12,500	12,500
Oil and hazardous substances spills	13,000	14,500	14,500
Number of pollution investigations	12,500	12,500	12,500
District hearings	1,100	1,200	1,300
Number of civil penalties	3,200	3,400	3,400
Cargo transfer operations monitored	13,500	15,000	15,000
Oil pollution removal operations	1,600	1,700	1,800
Ocean dumping surveillance missions	800	600	200
Port safety:			
Cargo vessels/barges boarded	62,900	64,800	66,700
Waterfront facilities inspected	57,600	59,000	59,000

[4] U.S. Coast Guard. Congressional Affairs Office. Telephone conversation of Dec. 17, 1981.

[5] Workload data from Department of Transportation. U.S. Coast Guard. Fiscal year 1982 budget estimates. Submission to Congress; pp. OE-5 and OE-6. Since the formation of the PES program occurred in May 1980, budgetary and workload data do not reflect the current program definition. As a result, this analysis will combine workload and budgetary data of the port safety and security (PSS) and the marine environmental protection (MEP) programs. Some of the MEP data reflects responses to pollution discharges, but for the most part the data is reflective of trends in the PES area.

	Workload data		
	1980 actual	1981 estimate	1982 estimate
Explosive loadings and other dangerous cargo inspections	2,000	2,000	2,000
Harbor patrols (operating hours)	112,400	120,000	120,000

The Coast Guard estimates that approximately 2,684 personnel are required to perform the level of effort projected in the fiscal year 1982 budget. (See table 2.) These functions account for about 11 percent of total operational personnel. Capital plant usage would include the shoreside facilities for the 54 COTP's and the utilization of an average of 14.7 cutters per day or 6 percent of the total cutter inventory.

TABLE 2.—MILITARY OPERATIONAL PERSONNEL

	Level A	Level C	Current
Cutters	122	219	[1] 209
Aviation	641	554	554
Boat and direct	4,516	1,921	1,921
Total	5,279	2,694	2,684
Total operational personnel	41,474	29,942	25,352
PES ratio (percent)	13	9	.1
Cutters	3.2	14.6	14.9
Total operating cutters	389	278	245
PES ratio (percent)	1	5	6

[1] Cutter usage and personnel are expected to decrease as Coast Guard operations move to the optimum condition. This is predicated on the notion that additional cutter and boat resources will permit more efficient use.

Source: U.S. Coast Guard. Military personnel requirements. Report to the Department of Transportation and the Office of Management and Budget, October 1980.

Performance Standards

The port and environmental safety program has three primary objectives: "To assure the safety of vessels and of ports and waterways and their related shoreside facilities. To assure the security of vessels and of ports and waterways and their related shoreside facilities. To maintain or improve the quality of the marine environment." [6]

These primary objectives are based on statute described earlier, Coast Guard practice, and international convention.

The PES program performs 43 functions (see Addendum p. 64) essential to the safe and secure operation of the Nation's and harbors. These activities can be subdivided into five broad categories.[7]

One, the COTP will seek "to minimize loss of life, personal injury, and property damage * * * " in the marine environment subject to U.S. juridisction.

Two, the COTP will perform functions which will facilitate waterborne transportation.

Three, the COTP will insure that the port organization is prepared and ready to act in a national emergency or war.

[6] Operating program plan, p. I-1.
[7] Ibid.

Four, where applicable, the COTP will enforce U.S. law and/or U.S.-accepted international agreements.

Five, the COTP will establish liaison with other governmental agencies to assure the efficient utilization of public marine resources.

The PES program standards (see Addendum p. 57) seek to optimize the Coast Guard's ability to achieve its three principal goals for the program. The program standards establish criteria for the COTP's responsibilities in cargo transfer supervision, boarding of vessels carrying hazardous cargoes; inspection of waterfront facilities, controlling the movement of vessels carrying hazardous cargoes, investigation and enforcement of antipollution laws, and surveillance of coastal zones, and to coordinate, educate, and assist other Federal, State, and local authorities in these activities.

The specific criteria for the performance of the PES functions are based on projections derived from the extrapolation of historical data.[8] As one review of the PES operating program plan noted, the logic of the trend analysis behind the establishment of the standards is reasonable, but the "* * * tie between accomplishment of individual tasks and ultimate program benefits is absent."[9] However, the review noted that the establishment of program standard criteria was attempting to quantify benefits for which there may be no useful objective calculation. In other words, how is safety and security achieved and sustained?

Since it may be difficult to quantify benefits associated with the PES program's three main objectives, are there lower levels of performance which could continue to satisfy the requirement for the safe and secure operation of the ports and harbors? This question has not been fully addressed. Projections based on historical data may or may not continue to allow the Coast Guard to provide a safe port network.

Does the Coast Guard Meet the Standards?

No matter how the performance standard criteria are calculated, the Coast Guard data indicate it is not achieving the optimum level of performance. Despite the failure to attain the optimum level, because of resource constraints, the Coast Guard has managed to prevent a generalized breakdown in the operation of the ports and harbors.

The numbers of personnel and hardware devoted to the PES program are detailed in table 2 under the current level category. At its current level, the Coast Guard has only 50 percent of the operating personnel required to perform the PES functions at level A, the optimal level. Cutter usage is higher than would be necessary under the optimum conditions, because the Coast Guard is currently using cutters and boats inefficiently in all areas, not simply in port and environmental safety functions, because the mix of cutters and boats is not optimum.

If resources can constrain behavior, then what functions are being performed and what functions are not? Under current per-

[8] Military personnel requirements, pp. VII-29 to VII-31.
[9] Ibid, p. VII-31.

formance levels, the Coast Guard is able to control vessel movement, where hazardous cargoes are involved, at 100 percent of the optimum level. But the work hours involved in vessel movement control are relatively few, 7,908 hours. In the other subprograms, the Coast Guard is performing well in facility inspection (91 percent of goal), investigation and enforcement (84 percent), coordination, public education, and assistance (78 percent), new program developments (65 percent), support and administration (65 percent), and vessel boarding (54 percent). (See table 3 for details.) Two elements of the PES program are receiving less attention under current levels. These two are surveillance activities (47 percent) and cargo transfer supervision (34 percent). Despite having only 50 percent of the resources required to perform at the optimum level, the PES program is currently providing 62.5 percent of the optimum workload.

TABLE 3.—PES PERFORMANCE STANDARDS—WORK HOUR GOALS AND CURRENT

Work hours	Goal	Current
Cargo transfer supervision:		
1. Monitor liquid bulk transfer operations of oil or hazardous substances	147,750	42,750
2. Monitor tanker oil transfers and bunkering operations at deepwater ports	12,000	6,000
3. Monitor cargo of particular hazard transfer operations	66,000	20,400
4. Supervise class A explosives transfer operations; conduct preload inspections	17,930	13,000
5. Supervise regulated radioactive material transfer operations	1,200	800
Vessel boarding:		
6. Board vessels to insure compliance with dangerous cargo regulations	216,000	91,200
7. Board tank vessels to insure compliance with oil and hazardous substance discharge prevention regulations	74,865	59,800
8. Board special interest vessels	16,000	16,000
Facility inspection:		
9. Spot check each designated waterfront facility	43,200	42,800
10. Inspect each designated waterfront facility	27,000	22,500
11. Survey all waterfront facilities	10,000	8,160
12. Inspect firefighting and safety equipment, records and logs rerquired, and oil transfer controls and procedures at deepwater ports	280	140
13. Visually inspect cargo transfer hoses in use at deepwater ports	400	200
14. Observe required monthly emergency drills performed by deepwater port operating personnel	100	50
Vessel movement control:		
15. Control the movement of vessels handling class A explosives and cargoes of particular hazard; and also any other vessels which the COTP determines are presenting an unacceptable hazard if not controlled	3,750	3,750
16. Escort oceangoing merchant vessels laden with class A explosives and cargoes of particular hazard	4,158	4,158
Investigation and enforcement:		
17. Send Coast Guard representative to the scene of reported pollution discharges. Follow through on investigations in support of enforcement actions	129,787	109,947
18. Send an Investigating Officer to the scene of incidents and accidents involving waterfront facilities. Follow through on investigations in support of enforcement actions	83,300	76,500
19. Process and take necessary enforcement action on violations detected	76,541	56,280
Surveillance:		
20. Conduct airborne surveillance of coastal areas	4,632	5,866
21. Conduct airborne surveillance of port and harbor areas	3,793	3,991
22. Conduct airborne surveillance of deepwater ports and approach channels	104	52
23. Conduct patrols of essential harbor areas by boat or vehicle	531,867	222,652
24. Conduct patrols of remote harbor areas by boat or vehicle	34,291	31,424
25. Patrol established security and safety zones	8,760	8,760
26. Patrol deepwater port safety zones	500	250
27. Conduct surveillance of ocean dumping operations	38,007	16,000
28. Conduct surveillance of special interest vessels	4,000	4,000
Coordination, public education, and assistance:		

TABLE 3.—PES PERFORMANCE STANDARDS—WORK HOUR GOALS AND CURRENT—Continued

Work hours	Goal	Current
29. Meet with other Federal, State, and local law enforcement and safety agencies to discuss and settle problems, and to maintain good liaison	48,824	35,900
30. COTP or designated staff officer meet with other Federal, State, and local officials to review and coordinate development of contingency plans for nonenvironmental emergency and disaster response	32,776	24,100
31. Pursue a public education program concerning law enforcement by meeting with media, public appearances, or meeting with public leaders	28,380	16,500
32. Assist other agencies and local authorities with the enforcement of laws and regulations and also with emergency and disaster response	39,900	39,900
Support and administration:		
33. Establish and administer security and safety zones	2,100	2,100
34. Maintain a means of screening and limiting access to port facilities (port security cards)	6,700	6,700
35. Identify resource needs by gathering and examining data; conduct analysis; reprogram or request new resources as necessary	89,107	65,520
36. Provide field units with historical information on vessels (MSIS)	42,312	24,600
37. Develop contingency plans for response to nonenvironmental emergencies and disasters	66,232	48,700
38. Conduct necessary unit training and qualifications	228,139	142,600
39. Support performance of program missions; maintain physical plant	1,232,036	716,300
40. Administer the PES program	871,287	640,652
Elements under development:		
41. Conduct surveillance and enforcement of Outer Continental Shelf activities and lightering ops	703,015	456,960
42. Supervise the implementation of reception facilities under the Act To Prevent Pollution from Ships	23,520	23,520
43. Conduct surveillance patrols for detection of oil and hazardous substances spills in the areas of jurisdiction added by the Clean Water Act	8,148	0
Total PES work hours	4,978,691	3,111,482
Current as a percent of goal		62.5

Source: U.S. Department of Transportation. U.S. Coast Guard. Port and environmental safety fiscal years 1983-92. Operating program plan. Washington, Dec. 8, 1980, pp. V-16 to V-69.

Resources Required To Perform at Optimum

The Coast Guard believes its greatest resource deficiency in the PES program is in the number of operating personnel required for the optimum program level. (See table 2.) Current operating personnel assigned to the PES program represent approximately 50 percent of the number required for the optimal performance level. Hardware requirements, on the other hand, would decrease given additional cutter, boat, and aircraft procurements. A decrease would result from the efficiencies achieved through the greater rationalization of the cutter and aircraft inventory.

However, if more resources are not forthcoming, then the Coast Guard has two choices: First, cut all programs equally and try to perform a little of all functions, or second, establish priorities and perform only the most important functions. It would appear that the Coast Guard is attempting to do a little of both in the port and environmental safety program.

As noted earlier, current performance levels would suggest that only vessel movement control is performing 100 percent of its goal. All other programs are performing at suboptimal levels. This would suggest that the Coast Guard might consider the possibility of restructuring its priorities in the PES program. For example, the

support and administration function consumes 53 percent of the current work hours for the PES program. Even at the optimum level, support and administration would require only 50 percent of the work hours. A 6-percent reduction in current support workload would yield 93,344 hours that could be devoted to other functions and still provide support and administration with 50 percent of the program work hours. One possible distribution of the hours could be to cargo transfer supervision which would improve performance from 34 percent of goal to 72 percent. Given the fact the further resources may not be forthcoming and that the PES program is so intensive in support and administration, it could be argued that redistribution of priorities could positively affect the captains of the port's responsibilities in port safety.

Transfer of Functions

It has been suggested that the law enforcement functions of the captain of the port could be transferred to local authorities.[10] Operating through a grant program, the Coast Guard would decentralize its ports' safety and security functions to the local level. Localities would establish their own marine law enforcement agencies. The Coast Guard would coordinate the local efforts to insure that regulations are standarized. In addition, the Coast Guard, on a reimbursable basis, would provide personnel to those local areas unable to provide and/or sustain law enforcement personnel. The principal advantage of such a decentralization effort would be that local authorities would be able to obtain a continuous law enforcement prescence specifically designed for local needs. In addition, the local community would establish the level of support it desired for maritime law enforcement. A principal disadvantage would be the multitude of local approaches to port safety and security and the generalized lack of uniformity in the Nation's ports and harbors. This lack of uniformity would become particularly acute during moblization for national emergency or war when the ports and harbors become vital links in the movement of cargoes for the war effort.

ADDENDUM

PORT AND ENVIRONMENTAL SAFETY PROGRAM (PES)—V. PROGRAM STANDARDS

Element	*Criteria*
Cargo transfer supervision:	
1. Monitor liquid bulk transfer operations of oil or hazardous substances.	20–30 percent of operations involving vessels with tank capacity of 250 barrels or more. Monitor bunkering operations on random basis.
2. Monitor tanker oil transfers and bunkering operations at deepwater ports.	50 percent of operations.
3. Monitor cargo of particular hazard transfer operations.	100 percent of operations.

[10] Military personnel requirements, p. VI-7.

PORT AND ENVIRONMENTAL SAFETY PROGRAM (PES)—V. PROGRAM STANDARDS—Continued

Element	*Criteria*
4. Supervise class A explosives transfer operations; conduct preload inspections.	Do.
5. Supervise regulated radioactive material transfer operations.	Do.
Vessel boarding:	
6. Board vessels to insure compliance with dangerous cargo regulations.	Board 50 percent of all vessels not boarded for supervision purposes.
7. Board tank vessels to insure compliance with oil and hazardous substance discharge prevention regulations.	10–15 percent of all tank ships and tank barges.
8. Board Special Interest Vessels	All category I vessels.
Facility inspection:	
9. Spot check each designated waterfront facility.	Monthly.
10. Inspect each designated waterfront facility.	Once every 6 months.
11. Survey all waterfront facilities.....	Once every 2 years.
12. Inspect firefighting and safety equipment, records and logs required, and oil transfer controls and procedures at deepwater ports.	Quarterly.
13. Visually inspect cargo transfer hoses in use at deepwater ports.	Weekly.
14. Observe required monthly emergency drills performed by deepwater port operating personnel.	Observe one drill per year.
Vessel movement control:	
15. Control the movement of vessels handling class A explosives and cargoes of particular hazard; and also any other vessels which the COTP determines are presenting an unacceptable hazard if not controlled.	100 percent of these vessels.
16. Escort oceangoing merchant vessels laden with class A explosives and cargoes of particular hazard.	All which COTP believes present a potential danger to port facilities or inhabitants.
Investigation and enforcement:	
17. Send Coast Guard representative to the scene of reported pollution discharges. Follow through on investigations in support of enforcement actions.	100 percent of reported polluting discharges.
18. Send an investigating officer to the scene of incidents and accidents involving waterfront facilities. Follow through on investigations in support of enforcement actions.	100 percent of all incidents which may affect the safety of ports and waterways.
19. Process and take necessary enforcement action on violations detected.	All violations.
Surveillance:	
20. Conduct airborne surveillance of coastal areas.	MSM (CG–495) chapter 80 defines frequency and density of coastal patrols.
21. Conduct airborne surveillance of port and harbor areas.	Frequency of patrols based on quantities of petroleum handled. See MSM (CG–495) chapter 80.

PORT AND ENVIRONMENTAL SAFETY PROGRAM (PES)—V. PROGRAM STANDARDS—Continued

Element	*Criteria*
22. Conduct airborne surveillance of deepwater ports and approach channels.	Twice each week.
23. Conduct patrols of essential harbor areas by boat or vehicle.	Conduct one daylight and one night patrol each day. Boat patrols are preferred.
24. Conduct patrols of remote harbor areas by boat or vehicle.	Conduct one patrol each month.
25. Patrol established security and safety zones.	As required by the district commander.
26. Patrol deepwater port safety zones.	Twice each week.
27. Conduct surveillance of ocean dumping operations.	As per MSM chapter 84.
28. Conduct surveillance of special interest vessels.	As required.
Coordination, public education and assistance:	
29. Meet with other Federal, State and local law enforcement and safety agencies to discuss and settle problems, and to maintain a good liaison.	As required or, in the absence of problems, semi-annually.
30. COTP or designated staff officer meet with other Federal, State, and local officials to review and coordinate development of contingency plans for nonenvironmental emergency and disaster response.	Meet annually.
31. Pursue a public education program concerning law enforcement by meeting with media, public appearances, or meeting with public leaders.	One contact per month.
32. Assist other agencies and local authorities with the enforcement of laws and regulations and also with emergency and disaster response.	As required.
33. Establish and administer security and safety zones.	Do.
34. Maintain a means of screening and limiting access to port facilities (port security cards).	Do.
35. Identify resource needs by gathering and examining data; conduct analysis; reprogram or request new resources as necessary.	Do.
36. Provide field units with historical information on vessels (MSIS).	As required by Presidential mandate of 1977.
37. Develop contingency plans for response to nonenvironmental emergencies and disasters. (terrorist acts, fires, explosions, and so forth.).	Each COTP, in concert with other Federal, State, local, and private interests.
38. Conduct necessary unit training and qualification programs.	As required.
39. Support performance of program missions; maintain physical plant.	Do.
40. Administer the PES program	Do.

PORT AND ENVIRONMENTAL SAFETY PROGRAM (PES)—V. PROGRAM STANDARDS—Continued

Element	*Criteria*
Elements under development:	
41. Conduct surveillance and enforcement of Outer Continental Shelf activities and lightering operations.	Specific standards under development.
42. Supervise the implementation of reception facilities under the Act to Prevent Pollution from Ships.	Do.
43. Conduct surveillance patrols for detection of oil and hazardous substances spills in the areas of jurisdiction added by the Clean Water Act.	Do.

Source: U.S. Department of Transportation. U.S. Coast Guard. Port and environmental safety fiscal year 1983–92. Operating program plan. Dec. 8, 1980, pp. V–1 to V–4.

MARINE ENVIRONMENTAL RESPONSE PROGRAM*

Basis for Responsibility

Several domestic statutes and international agreements form the legal basis for the Coast Guard's marine environmental protection (MEP) programs. For the most part, these statutes were enacted within the last decade and significantly expanded the Coast Guard's role in this area.

Ports and Waterways Safety Act (33 U.S.C. 1221-1232)

The 1972 Ports and Waterways Safety Act and its comprehensive 1978 amendments [1] authorize the preventative aspects of the MEP programs. In addition to its environmental protection functions, the act also seeks to prevent loss of life and property during a pollution incident. Specific design, equipment, and operating requirements are outlined within the act. Vessel traffic schemes, specific navigation equipment, identification of hazardous areas, pilotage requirements, are mandated as well.

Federal Water Pollution Control (33 U.S.C. 1251-1376)

The Nation's major water quality statute, the Federal Water Pollution Control Act (FWPCA), also authorizes part of the Coast Guard's marine environmental protection activities. For the most part, the FWPCA authority is corrective response authority, providing for prompt removal and mitigation in the event of a pollution incident. The FWPCA sec. 311 establishes a revolving cleanup fund, maintained by appropriations and administered by the Coast Guard. The only regulatory authority provided is for regulation of marine sanitation devices.

Marine Protection, Research and Sanctuaries Act (33 U.S.C. 1401-1444)

While the EPA and the Corps of Engineers have the responsibility under the statute for regulating the dumping of materials into ocean waters, the Coast Guard has the responsibility for monitoring all such operations and enforcing this law.

Deepwater Port Act (33 U.S.C. 1501-1524)

The Coast Guard is authorized to regulate the location, ownership, construction, and operation of deepwater ports [2] in areas around the deepwater port facility, a connecting pipeline, or a

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* Prepared by Martin R. Lee, analyst in environmental policy, Environment and Natural Resources Policy Division.

[1] Port and Safety Tanker Act of 1977, 33 U.S.C. 1221 et seq. Public Law 94-474. Oct. 17, 1978.

[2] At present there is only one operating deepwater port, off the Louisiana coast, and one in the planning stages off Texas.

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vessel. The pollution fund for deepwater port-related oil spills is administered by the Coast Guard.

Outer Continental Shelf Lands Act Amendments (43 U.S.C. 1331-1356)

In relation to oil and gas operations on the Outer Continental Shelf, the Coast Guard has several assigned responsibility under the Outer Continental Shelf Lands Act (OCSLA). These include enforcement of safety and environmental regulations, onsite inspections, investigations and reporting of pollution incidents. Also, administration of an OCS oil pollution liability and compensation fund, maintained by a fee on OCS oil, is assigned to the Coast Guard.

Rivers and Harbors Act of 1899 (33 U.S.C. 401-466)

The earliest assignment of an environmental protection function was through the Rivers and Harbors Act of 1899, which prohibited depositing of refuse into navigable waters, as well as the obstruction of waterways. The Coast Guard has some enforcement authority while the Corps of Engineers administers the permit programs.

International agreements

Since most oil arrives on foreign-owned and foreign-registered vessels, control over foreign vessels which may pose a threat to U.S. waters has been an important component of the Coast Guard's marine environmental protection strategy. A number of international agreements have been negotiated under the auspsices of the International Maritime Consultative Organization (IMCO). The main source of international jurisdiction over vessel pollution is the 1954 International Convention for the Prevention of Pollution of the Sea by Oil, and subsequent protocols generated under this convention. These conventions, binding on the majority of maritime nations, strengthen Coast Guard control over foreign-owned and foreign-operated tank vessels.

Budgetary Resources Currently Allocated to Marine Environmental Protection (MEP)

Overall, 10.8 percent of the Coast Guard's fiscal year 1982 budget will be directed toward MEP programs, accounting for $152.8 million requested.[3] The table below shows the MEP account in three main areas:

TABLE 1.—*Marine environmental protection, fiscal year 1982*

	Millions
Operating expenses	$107.3
Acquisition, construction, and improvements	35.4
Research, development, test, and evaluation	10.1
Total	152.8

In comparison to fiscal year 1981 spending rates, this is down slightly, 0.8 percent, from current estimates, and is considered to be at or below "current services levels."

[3] Based on U.S. Department of Transportation. Coast Guard. Fiscal year 1982 budget estimates. Submission to Congress. Various pagings.

Manpower resources directed toward marine environmental protection account for 3,337 full-time permanent positions or 8.6 percent of the total 38,301 positions requested for fiscal year 1982, representing an increase of 34 positions over the current fiscal year.

OPERATING EXPENSES FOR MARINE ENVIRONMENTAL PROTECTION

Operating expenses account for 64 percent of the total Coast Guard budget, and similarly account for 70 percent—$107.3 million—of the total marine environmental protection request for fiscal year 1982.[4]

For manpower, the percentage is considerably larger. Over 96 percent of the MEP's fulltime permanent positions are devoted to MEP's operating programs, with a 21-position increase requested for fiscal year 1982.

The eight operating activities for marine environmental activities are listed below with current and fiscal year 1982 workload data.

TABLE 2.—MARINE ENVIRONMENTAL PROTECTION ACTIVITIES

Activity	Fiscal year	
	1981	1982
Aerial oil pollution patrols (employment hours)	12,500	12,500
Oil and hazardous substances spills	14,500	14,500
Number of pollution investigations	12,500	12,500
District hearings	1,200	1,300
Number of civil penalties	3,400	3,400
Cargo transfer operations monitored	15,000	15,000
Oil pollution removal operations	1,700	1,800
Ocean dumping surveillance missions	600	[1] 200

[1] Ibid. Employment hours are indicated with first activity while all other entries indicate incident numbers.

Of the eight activities, only one deals with actual pollution cleanup response, while the others are "preventive" in nature. The reason for the drop in ocean-dumping surveillance missions could be credited to the phasing out of some ocean-dumping activities. Otherwise, most categories remain constant with a slight increase in removal operations in the estimate. A $133,000 and 12 military personnel increase is requested in Coast Guard operating funds, under the MEP category, to enhance its antipollution capability. This would be directed to, first, provide support funding for facility lease, travel, training, vehicles; second, provide maintenance funds for oil pollution equipment purchased in previous years; third, provide training instructors and support for a Coast Guard/Environmental Protection Agency course dedicated to chemical spill response; and augment the national strike force with personnel to provide for increases in chemical spill response.[5]

ACQUISITION, CONSTRUCTION, AND IMPROVEMENTS

Of the Coast Guard's "acquisition, construction and improvements" budget, 9.4 percent is directed toward marine environmen-

[4] Ibid, p. OE-20.
[5] Ibid, p. OE-20.

tal protection, or $35 million of a total $375 million. For the most part this MEP activity will be concerned with the procurement of the medium range surveillance (MRS) aircraft and short-range recovery helicopters.[6]

In regard to manpower, 59 or 14.3 percent of the total full-time permanent positions in acquisition, construction, and improvement are for marine environmental protection. One new position is requested.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Marine environmental protection represents a significant part of the Coast Guard research, development, test, and evaluation account, and it is increasing by $2.7 million in fiscal year 1982. While in the first two categories, MEP was responsible for only a small part of the total budget category, MEP accounts for 33.7 percent or $10.1 million of the total $30 million request for research, development, test, and evaluation.

Similarly 80 or 34.3 percent of the total R.D.T. & E. positions are for marine environmental protection. The fiscal year 1982 personnel figure represents an increase of 12 over the fiscal year 1981 figure.

Three major areas of development in the Coast Guard's R.D.T. & E., fiscal year 1982 program are directed at (a) hazardous chemical, (b) oil pollution response, and (c) detection and enforcement. The general statement noted that the program seeks to "develop all weather means of detecting, identifying and quantifying discharges of oil and hazardous chemicals; develop techniques for oil and hazardous chemicals; develop techniques for oil discharge response in various weather conditions; ascertain response techniques effective for spills of non-oil hazardous chemicals, including methods of personnel protection." [7]

For hazardous chemicals, response techniques are still in the infant stages. The Coast Guard's fiscal year 1982 R.D.T. & E.[8] plan emphasizes hazardous substance personnel, identification methods, mitigation, containment and disposal, as well as information and equipment problems. The fiscal year 1982 request seeks to direct $1.4 million to conduct feasibility studies, develop models, assess hardware, develop prototype systems, and test and evaluate prototypes for Coast Guard use. Similar amounts were spent for this purpose in fiscal years 1978–81.

In the areas of oil pollution response, problems were identified in cold region and extreme weather cleanup, hazard vessel assessment, and vessel salvage. Deficiencies were also noted in ways to quantify oil in slicks, to assess damaged tanks of vessels, and to store and dispose of wastes and pollutants. The Coast Guard seeks $900,000 for these R.D.T. & E. efforts. The approach will develop computer programs to: Predict the dispersion of oil and cooling of cargoes, test and develop equipment and techniques for moving cargoes, locate and remove oil from under ice, and recover oil from ex-

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[6] Ibid, p. AC-4.
[7] Ibid, p. RD-10.
[8] "U.S. Coast Guard R.D.T. & E. Plan for Marine Environmental Protection." Washington, U.S. Department of Transportation.

treme conditions. Approximately 50 percent of this effort will be directed toward Arctic spill response, 15 percent to multiagency tests and technique development, and 35 percent to prevention, reduction, and salvage R.D.T. & E.

Finally, the largest R.D.T. & E. effort, $3 million, will be assigned for detection and enforcement. This stems from the Coast Guard's inability to adequately detect and identify pollution discharges, which result in polluters escaping liability. This is a continuation of the Coast Guard's efforts to develop all-weather means of detecting, identifying, and quantifying discharges of oil and hazardous substances. The main approach will be to develop a prototype aerial surveillance system (AIREYE) for oil pollution detection.

POLLUTION FUNDS

The Coast Guard administers three oil pollution funds: The Federal Water Pollution Control Act's 311 fund, the Outer Continental Shelf Lands Act's offshore pollution fund, and the deepwater port fund.

The fiscal year 1981 history of the FWPCA fund administration shows that approximately $17.1 million was spent on pollution fund activities and $6 million was transferred to the newly created hazardous substance response trust fund (Superfund) under the administration of the Environmental Protection Agency.

For OCS offshore oilspills, a $10 million industry-maintained fund is administered by the Coast Guard. To date, OCS spills have been reportedly insignificant.

For spills from deepwater ports a $10 million fund will be maintained and administered by the Coast Guard.

BUDGET SUMMARY

The marine environmental protection budget is primarily an operating and research budget; capital expenditures are minor. MEP budget represents 10.8 percent or $152.8 million of the total Coast Guard budget and 8 percent of the total positions.

The emphasis is on marine environmental protection operating activities to which 70 percent of the MEP budget and 90 percent of the manpower is devoted. In contrast, only 9.4 percent or $35.4 million, and 14 percent of the positions of the MEP program are directed to acquisition, construction, and improvement. The MEP research, development, test, and evaluation budget represents about a third of the overall Coast Guard R.D.T. & E. budget.

For fiscal year 1982 the Coast Guard predicts MEP operating activities at current services levels, direction of capital plant funds to short-range aircraft and helicopters, and research on all-weather detection and cleanup of spills.

Measurement of Marine Environment Programs

The Coast Guard has two major statutory marine environmental protection goals: To respond to pollution incidents and prevent accidental discharges through regulation. The response goal stems from section 311 of the Federal Water Pollution Control Act while

the preventive goal is derived from the Ports and Waterways Safety Act, for the most part.

Following a series of major oil spills in 1976–77, the President issued a Presidential message on oil pollution on March 17, 1977 [9] setting several administrative goals to lessen the potential for accidental spills. The 1978 amendments to the Ports and Waterways Safety Act adopted some of these recommended regulatory changes as law.

These statutory and regulatory goals are probably best discussed in terms of (a) corrective pollution response, (b) pollution fund administration, (c) preventive regulation, and (d) supporting information systems.

CORRECTIVE POLLUTION RESPONSE

The first priority of the MEP programs is response to all actual and potential discharges of oil and hazardous substances in navigable waters of the United States. This is one area where there appears to be little past criticism of the Coast Guard since the policy has remained the same, that is respond to all spills reported to the Coast Guard. According to Coast Guard statistics, 12,500 pollution incidents were investigated during fiscal year 1981, representing almost all major incidents reported to the Coast Guard. In relation to the response effort there are various lesser goals related to surveillance and monitoring, contacting for cleanup, and development of cleanup equipment for specific areas.

Surveillance and monitoring

Sending a representative to the scene of a major pollution incident is a major and continually realized goal of the Coast Guard, mandated by the FWPCA through the establishment of the national contingency plan.[10] A second goal is to monitor any actions taken by either private contractors or State and local governments. This is required by Executive order and the national contingency plan.[11] To enhance the Coast Guard's ability to investigate and monitor spills, several research and development efforts are emphasized by the Coast Guard's fiscal year 1982 budget. They promote the development of the AIREYE remote sensing system for oil spill surveillance.

Contracting for cleanup

Another established goal by the FWPCA and the national contingency plan is "to remove, or arrange for removal of the polluting discharge, if the responsible party is not taking appropriate action or is unknown." [12] While scant criticism exists as to the Coast Guard's accomplishing its goal of investigating the scene of a spill, the goal of removal has brought some criticism. Criticism has been associated with the Coast Guard's reliance on private contractors and overall cleanup efforts.

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[9] "Marine Transportation of Oil", message from the President (PM–52). (Reprinted in the Congressional Record, Mar. 17, 1977, p. S4223.)

[10] FWPCA section 311 and national contingency plan, 40 CFR Part 1510.

[11] E.O. 11735, E.O. 12316, and 40 CFR 1510.

[12] Public Law 92–500 and 40 CFR 1510.

But, according to the Coast Guard, it does not have a major cleanup capacity, relying instead on private contractors in coastal and inland areas. Earlier this year a Coast Guard spokesman noted that the Coast Guard continues to use private contractors "whenever they are available and capable." [13]

One of the goals of the 1977 Presidential inititatives on oil spills was to enhance the Coast Guard's cleanup ability by establishing national strike force personnel at 14 key locations backed by $32.8 million in cleanup equipment. Reliance on contractors and three strike force sites was substituted for this goal.

Backing up Coast Guard and Coast Guard-contracted cleanup capability are cleanup cooperatives and industry cleanup capabilities. In heavily trafficked areas such as the Gulf of Mexico and New York Harbor, private industry has purchased its own standby equipment while, on the Outer Continental Shelf, the Coast Guard relies almost totally on the equipment of the offshore industry since there is little commercial cleanup capability available offshore and since the Coast Guard has little capability itself.

Cleanup equipment for specific problem areas

Cognizant of its responsibility for cleanup in all areas and aware of the lack of commercial equipment, the Coast Guard has identified the development of cleanup equipment for arctic areas, fast-moving waters, and high seas as a research and development priority. Approximately $3 to $4 million will be devoted to this effort during fiscal year 1982. Work continued on this according to Coast Guard spokesmen. Specifically the Coast Guard R.D.T. & E. effort will attempt to develop an electromagnetic sensor capable of detecting oil under ice, develop a model to predict the movement and migration of oil in arctic areas, and assess the applicability of existing equipment in arctic areas.[14] Cleanup on the high seas and in fast-moving waters remains a goal of the Coast Guard but technology still only permits cleanup in 3-to-5-foot seas.

POLLUTION FUND ADMINISTRATION

A second objective related to the overall response and cleanup goal is administration of the FWPCA's section 311 cleanup fund, as well as the Outer Continental Shelf Land Act and Deepwater Port Act's funds. Since the latter two funds have been used infrequently, little criticism has arisen over their administration. But administration of the 311 fund has brought the Coast Guard under some criticism. The appropriation-maintained fund has rarely been maintained at its full size, requiring the Coast Guard to constantly prioritize cleanup expenses.

A proposed solution to this dilemma has been the Comprehensive Oil Pollution Liability and Compensation Act which would establish a $100 million fund supported by a fee on oil.[15] The Coast Guard supported this legislative concept in three congresses but,

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[13] U.S. Congress. House Committee on Appropriations. Coast Guard fiscal year 1982 budget. Hearings, 97th Congress, 1st session.

[14] Ibid, pp. 422-423.

[15] Comprehensive Oil Pollution Liability and compensation Act. H.R. 85 (Biaggi). Introduced Jan. 5, 1981. Reported from Merchant Marine and Fisheries with amendments (H. Rept. 97-120 pt. 1).

under the new policies of the Reagan administration, has reversed its stand.

The other criticism associated with the Coast Guard's administration of the 311 fund is recovery of expenditures. For instance, of the $108 million in Federal funds obligated over the past 10 years, only about one-half has been recovered. On several occasions the Coast Guard has come under attack for this. The Coast Guard argues that litigation is time consuming and protracted. Without passage of a comprehensive oil cleanup fund, a remote possibility at this time, this problem will undoubtedly continue.

PREVENTIVE REGULATION

While emergency response is an important statutory goal for the Coast Guard, preventing such incidents is an equally important goal for the Coast Guard. To this end a major regulatory effort has been established from authorities in the Federal Water Pollution Control Act, the Ports and Waterways Safety Act, the Presidential initiatives of 1977, and other administrative actions. They seek to establish design and operation requirements for tankers, barges, and facilities. The essence of these regulations is to make transportation safe and to verify that the safety requirements are met.

Tankers

Since the bulk of accidents and oilspills are associated with tankers, a number of goals are associated with tanker regulation. Specifically, the Coast Guard seeks to "eliminate 85 percent of the international discharges of oil and hazardous substances from vessels and transportation related facilities into U.S. waters; and reduce accidental discharges by 75 percent; reduce the quantity discharged by 80 percent." [16]

In fact, the number of discharges and amount of oil discharged internationally and nationally has decreased. According to the Center for Short-Lived Phenomenon, the amount of oil spilled worldwide dropped 55 percent between 1979 and 1980.[17] Table 3 below demonstrates the trend in oilspills nationwide:

TABLE 3.—OILSPILLS IN U.S. WATERS 1975–80

Year	Number of incidents	Amount of oil spilled (million gallons)
1975	10,141	14.4
1976	10,660	23.1
1977	12,844	19.8
1978	11,950	14.3
1979	10,990	10.5
1980	7,837	[1] 7.3

[1] U.S. Coast Guard. "Polluting Incidents In and Around U.S. Waters. Calendar Year 1979 and 1980." 44 page.

Whether this trend can be credited toward Coast Guard regulation is a difficult connection to make. Since many major maritime nations and the Intergovernmental Maritime Consulative Organi-

[16] U.S. Coast Guard. U.S. Coast Guard military requirements.
[17] Oil spill intelligence report, Oct 16, 1981, vol. IV, No. 40.

zation have been active in tanker regulation in the last few years, perhaps some of the credit might go to these activities. Some credit fate with this reduction and insist the potential for significant inputs of oil is still present.

The critical regulations of the 1977 Presidential initiatives, and of the 1978 Port and Safety Tanker Act, are those requiring segregated ballasts and crude oil washing systems. They became effective in June for large tankers.[18] Also, the tanker boarding program was initiated in 1978, as required, but the goal of boarding every tanker every year has slipped to boarding only 10 percent of the tankers per year, the Coast Guard milestone.[19] Additionally, regulations on dual radar required by the 1978 Port and Tanker Safety Act have not yet been published, nor has the Coast Guard proposed regulations on retrofitting 20,000- to 40,000-deadweight-ton tankers with ballast tanks and crude oil washing systems, as required.

While the regulations for segregated ballasts and crude oil washing systems went into effect June 1, 1981, already the Coast Guard is considering hardship exemptions for vessels experiencing difficulties in retrofitting. Significant numbers of exemptions coupled with the lack of regulations for the smaller 20,000- to 40,000-deadweight-ton tankers could significantly weaken the vessel regulatory scheme. Regulations on vessel maneuverability have only recently been proposed, after almost 4 years in the making. Another issue centers on the use of Puget Sound for supertanker traffic. The Coast Guard, by regulation, has prohibited such vessels from Puget Sound, but may reconsider pending the testing results.

Barges

Barges present special spill potential due to their usual proximity to sensitive nearshore environments. The regulatory program has not been as aggressive for barges as for tankers. The 1977 Presidential initiatives directed a study on barge construction which has only recently been completed. For proposed design standards for tank barges, the Coast Guard regulatory agenda merely notes, "Further action to be determined."

Offshore facilities

Offshore facilities present additional problems for the Coast Guard. With increased oil and gas activity offshore, the Coast Guard's monitoring, inspection, and enforcement activities have been expanded, while the Coast Guard's budget has not. The Coast Guard has, for instance, reduced the number of mobile offshore drilling platform inspections by one-half. The Coast Guard has attempted to deal with the expanded responsibility through cooperative inspection agreements with the U.S. Geological Survey, and with the offshore industry itself. The Coast Guard has not yet promulgated regulations on the best and safest offshore technology, required by the Outer Continental Shelf Lands Act Amendments.

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[18] 42 FR 20046. Apr. 2, 1981. Department of Transportation. Coast Guard. Semiannual regulations: Agenda and review list.

[19] Coast Guard unpublished information submitted to CRS.

SUPPORTING INFORMATION SYSTEMS

Another goal established by the Presidential initiatives and the Ports and Waterways Safety Act is the establishment of information systems to support the Coast Guard's response, enforcement, and regulatory effort. The Coast Guard has set up several systems to aid in decisionmaking and enforcement. These include the pollution information retrieval system (PIRS), the marine information system (MIRS), and other systems related to chemical transportation. These are fully established systems but rely on input from normal Coast Guard activities such as response, enforcement, boarding, and inspection. A reduction in the input could necessarily detract from the effectiveness and utility of all these information systems.

The Coast Guard appears to have fully met the information systems goals established for it by the Port and Tanker Safety Act, and no significant criticism has been rendered on the subject.

SUMMARY

The Federal Water Pollution Control Act and the Ports and Waterways Safety Act, for the most part, set the goals and objectives for the Coast Guard's marine environmental protection programs. The goals are high for the response part of the program, namely, to respond to all major incidents. No change appears planned for this goal. Some criticism has been leveled at the Coast Guard's reliance on private cleanup contractors and its reductions in its national strike force plans. The emphasis of the Coast Guard's current research plan is on cleanup equipment for problem areas: Arctic regions, high seas, and fast-moving waters.

As to the administration of the pollution funds under its control, the Coast Guard has necessarily had to limit and prioritize its use of the 311 fund due to continued low fund levels. Some criticism of the Coast Guard's poor record on recovery of funds has been rendered.

The goals established for the preventive regulation part of the marine environmental protection programs have been more elusive and the object of more criticism. Generally there have been reductions in the number of incidents and volume of pollutants entering the marine environment—a major goal of the whole program. Whether this is a measure of the preventive regulatory program is subject to dispute. Some have contended that the Coast Guard has been slow to issue regulations on retrofitting smaller tankers, has reduced its tanker boarding program, and would reduce its present goals by offering exemptions to larger tankers from new design regulations.

Another controversy concerns the current reconsideration of the ban on supertankers in Puget Sound. Some feel this amounts to a reversal of a long established objective of the Coast Guard. And, considerable criticism has been leveled at the Coast Guard for its not having promulgated barge construction standards, a goal established by the Port and Tanker Safety Act. Similar criticism over the reductions in offshore inspection, delegation of offshore responsibilities to other Federal agencies, and the lack of offshore technology regulation has been rendered.

While the goal(s) of establishing supporting information systems has been realized, cutbacks in activities which act as the source of inputs to such systems could detract from their utility. For instance, the marine safety information system depends on information from the tanker boarding program, which now boards only 10 percent of the tankers calling on U.S. ports. The system then would only reflect a fraction of the tankers calling on U.S. ports.

Thus, while some overall goals and objectives have been reached, others have not. Specific criticism has been scant over the pollution response goals, while considerably greater over recovery of pollution funds, and preventive regulation such as small tanker design, barge design, and offshore inspection.

Estimates for Meeting Performance Standards

The USCG fiscal year 1982 budget is at or below the current services levels. By its own admission, the Coast Guard feels that such a budget will lessen its ability to enforce mandated pollution laws uniformly, to take adequate steps to minimize preventable discharges, and to carry out new responsibilities under the Clean Water Act and the Outer Continental Shelf Lands Act. For example, the Coast Guard estimates that at this current services level, only approximately a 65-percent mission performance standard can be attained.[20] This would include collection of penalties "as resources permit", reduced harbor patrols, "first aid" response to only one-half of reported minor spills, and only spot checks of liquid bulk facilities.

To achieve a "level A" performance at 100-percent mission performance, Coast Guard funding would have to improve considerably, but exactly how much has not been estimated.

To achieve some of the goals discussed earlier, the Coast Guard has outlined plans for 100-percent completion by fiscal year 1992.[21] This includes: A response capability of 5,500 tons a day, an Arctic cleanup capability, personnel safety techniques, capability to chart spill movement, and a mechanism to maintain the 311 fund at a level to meet operational requirements.

To effectively meet performance standards at a 100-percent level A in 1991 would require an almost 50-percent increase in personnel over a level C, depletion or nondepletion, level.[22]

Proposals To Reduce or Reassign Coast Guard Marine Environmental Responsibility

No formal changes have been planned for the Coast Guard's marine environmental protection responsibility, but several suggestions for changes have been discussed. They concern either assignment of certain functions to States or other Federal agencies, user fees for Coast Guard services, and contributing funds for cleanup expenses.

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[20] U.S. Coast Guard. "U.S. Coast Guard Military Personnel Requirements." Report to the Department of Transportation and the Office of Management and Budget. October 1980, p. VI-30.

[21] *See*: U.S. Coast Guard. "Program Plan for Marine Environmental Response." Fiscal year 1983-92.

[22] "U.S. Coast Guard Military Personnel Requirements."

REASSIGNMENT OF CERTAIN FUNCTIONS

Some marine environmental protection responsibilities might be assigned to States or other Federal agencies. Specifically, some States might assume more responsibility for pollution response and cleanup. Established contingency plans already inventory State cleanup capabilities. Some States have funds, maintained by fees on oil, for purchasing of cleanup equipment. Such a change in response would alleviate a drain on the operating program budget and the 311 fund. Also, the States might assume more responsibility for enforcement of Coast Guard-promulgated vessel design and operation standards. The States currently have almost no role in this area. A split program whereby the Coast Guard promulgates nationally uniform regulations while the States enforce such regulations might relieve operating programs and Coast Guard personnel.

A reassignment of vessel inspection to the Maritime Administration has been suggested. Some offshore inspection responsibility has already been delegated to the U.S. Geological Survey. The contention has been made that the Maritime Administration has more knowledge of vessel design and therefore might be more effective.

USER FEES FOR COAST GUARD SERVICES

If fees were charged for certain marine environmental protection activities, significant savings might be realized in the operating program budget. Charges could be directed for pollution response to the responsible party and for the many preventive inspections made by the Coast Guard.

CONTRIBUTING POLLUTION FUNDS

The idea of establishing a comprehensive oil pollution liability and compensation fund is not new, and has been seriously discussed since the 94th Congress. It would establish a fund to cover the cleanup costs now paid for the FWPCA fund which is maintained by appropriations. The effect would be to move the cost of pollution cleanup from Coast Guard budget to a fund maintained by a fee on oil. The administration has supported this in the past, but the Reagan administration and now the Coast Guard have announced their opposition to this concept.

Program Performance Levels

PROGRAM: MER

LEVEL: A

ELEMENT	CRITERIA	ANNUAL RESOURCE REQUIREMENTS (# and Type)				RESOURCE CHANGE FROM LEVEL C (# and Type)			
		Man Hours	Boat Hours	A/C Hours	Vehicle Hours	Man Hours	Boat Hours	A/C Hours	Vehicle Hours
1. Send monitor to scene of oil discharge to insure adequate removal unless removal not feasible, send monitor to scene of all hazardous substance discharges.	All discharges where Coast Guard is predesignated on-scene coordinator.	204,137	10,000	900	60,000	+87,779	+6,000	+400	+31,200
2. Remove polluting discharges when responsible party fails.	All discharges; when required and removal is feasible.	52,183	1,500 (FY 1978 Actual)	---	16,150	---	---	---	---
3. Send Coast Guard representative to scene of all reported polluting discharges.	All discharges.	12,963	118,519	---	406,509	+8,763	+76,519	---	+262,412

Program Performance Levels

PROGRAM: MER

Program Element Number and Description: 1) Monitor Discharge Removal Operations.

Level	%	Criteria	Annual Resource Requirements (# and Type)				Number and Type of Resource Change from Level C				
			Boat Hours	Vehicle Hours	A/C Hours	Man Hours	Boat Hours	Vehicle Hours	A/C Hours	Man Hours	Special Facilities
A	100%	All discharges where CG provides on-scene coordinator	10,000	60,000	900	204,137	+6,000	+31,200	+400	+87,779	--
B	57%	75%	6,000	35,000	500	116,358	+2,000	+6,240	+100	+28,578	--
C	43%	49%	4,000	28,800	400	87,780	-0-	-0-	-0-	-0-	--
D	43%	49%	4,000	28,800	400	87,780	-0-	-0-	-0-	-0-	--
E	26%	49%	2,500	15,000	250	53,076	-1,500	-13,800	-150	-34,704	--

REMARKS: Discharge monitoring involves all Coast Guard activity in supervising/monitoring the cleanup activities of the responsible party and/or his contracted agents.

This function, like SAR, is governed by the demand and not easily controllable by the Coast Guard

Program Performance Levels

PROGRAM: MER

Program Element Number and Description: 2) Remove all discharges where contractor support is inadequate or unavailable.

Level	%	Criteria	Annual Resource Requirements (# and Type)				Number and Type of Resource Change from Level C				
			Ship Days	Boat Hours	Vehicle Hours	Man Hours	Ship Days	Boat Hours	Vehicle Hours	Man Hours	Special Facilities
A	100%	1/ All required	--								--
B	100%	1/ All required	--								--
C	100%	1/ All required	--	2/ 1,500	16,150	52,183	--	-0-	-0-	-0-	--
D	100%	1/ All required	--								--
E	100%	1/ All required	--								--

REMARKS: Estimate of 5% of all discharges require removal by Coast Guard forces. This program element describes the "rare" instance where Coast Guard personnel do the actual discharge cleanup.

1/ Mandated at 100%

2/ FY 1978 - Actual

Program Performance Levels

PROGRAM: MER

Program Element Number and Description: 3) Investigate Pollution Discharges.

Level	%	Criteria	Annual Resource Requirements (# and Type)				Number and Type of Resource Change from Level C				
			Ship Days	Boat Hours	Vehicle Hours	Man Hours	Ship Days	Boat Hours	Vehicle Hours	Man Hours	Special Facilities
A	100%	Investigate all discharges	--	12,963	118,519	406,509	--	+8,763	+76,519	+262,412	--
B	51%	Investigate all discharges	--	6,611	60,445	207,320	--	+2,411	+18,445	+63,223	--
C	35%	Investigate all discharges	--	4,200	42,000	144,097	--	-0-	-0-	-0-	--
D	35%	Investigate all discharges	--	4,200	42,000	144,097	--	-0-	-0-	-0-	--
E	35%	Investigate all discharges	--	4,200	42,000	144,097	--	-0-	-0-	-0-	--

REMARKS: The investigation standard incorporates the time spent sending men to the scene of "false alarms" and time spent processing reports of polluting discharges at operating units. Estimate based on 14,000 discharges of oil, 3,500 false alarms, 3,500 discharges of hazardous substances.

WATERWAYS MANAGEMENT PROGRAM *

Background and Program Description

The Coast Guard waterways management (WWM) program is intended to achieve a high degree of operational safety in U.S. ports and waterways. Specific objectives of the progam are to:

1. Safeguard persons, vessels, and the marine environment in the Nation's ports, waterways, and offshore approaches from accidental destruction, damage or loss as a result of vessel mishaps; and
2. Promote safe and expeditious movement of marine transportation in U.S. ports and waterways.[1]

There are both passive and active concepts in vessel traffic management. Passive traffic management includes use of "rules of the road," traffic routing, and imposition of particular regulations in specific waterways and harbors such as speed limits, vessel size limitations, and restriction of operation to those vessels with particular operating characteristics and capabilities. When personnel not on board a vessel become involved in its operation, directly or indirectly, vessel traffic management becomes active. The vessel traffic services (VTS) are active vessel traffic management systems developed and installed by the Coast Guard in a number of U.S. ports and waterways over the past decade.

Within the Coast Guard's Office of Marine Environment and Systems, the Waterways Management Division has responsibility for active and passive vessel traffic management through the waterways management program, defined in terms of the following functions: [2]

Supervise the implementation and enforcement of the marine traffic managment provisions of the Ports and Waterways Safety Act, including:

Development, implementation, and periodic review of a national marine traffic management plan, including vessel traffic services;

Development and implementation of vessel traffic services in U.S. ports and waterways;

Development and implentation of a program of regulated navigation areas, including speed control on the inland navigable waters of the United States; and

Coordination and monitoring of all research, development, technology, and evaluation efforts affecting the marine traffic management systems.

Maintain liaison with other elements of the Coast Guard, the DOT, other Federal agencies, State and local governments, and other interested parties, as necessary, for the efficient and effective management of the marine traffic management responsibilities.

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* Prepared by Robert E. Morrison, specialist in marine science, Science Policy Research Division.

[1] U.S. Dept. of Transportation. Coast Guard. Waterways Management: Fiscal year 1983-92. Operating program plan. G-WWM. Washington, D.C., October 1980, p. I-1.

[2] Coast Guard Organization Manual. Commandant Instruction M5400.77 (OLD CG-229) Washington, D.C., Mar. 25, 1981, pp. 2-258 through 2-260.

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Develop U.S. position papers for the international coordination of marine traffic management; promote and participate in the international exchange of information relating to marine traffic engineering and management.

Develop and maintain training programs for traffic managment personnel.

Develop and maintain a VTS public information program.

Maintain statistical data to support the need for, and cost effectiveness of, marine traffic management activities.

Administer the program for the development of rules and regulations for the prevention of collisions, rammings, and groundings, including:

The preparation of recommendations for changes in statutory and regulatory actions affecting waterway safety;

Reviewing casualty records which involve Rules of the Road;

Setting vessel equipment requirements; and

Designation of areas where pilots are required.

Coordinate activities of the USCG Rules of the Road Advisory Committee.

Prepare policy interpretations concerning Rules of the Road.

Disseminate information concerning new proposals to the rules and regulations.

Assist other departments and units of the Coast Guard in waterway safety matters.

Supervise regulations and administration of Federal anchorages, safety, and security zones and regulated areas.

Participate, representing the U.S. Government, in several international navigation safety organizations, with the Chief, Waterways Management Division:

Serving as primary representative of the U.S. Delegation to the Inter-Governmental Marine Consultative Organization (IMCO) Navigation Safety Subcommittee; and

Serving as Chairman of the IMCO Safety of Life at Sea (SOLAS) Subcommittee Working Group on Safety of Navigation.

On May 1, 1980, the Coast Guard's Office of Marine Environment and Systems was reorganized concurrently with the creation of the Office of Navigation. After removal of the aids to navigation programs from the former Office to the latter, the remaining programs within the Office of Marine Environment and Systems were reapportioned into three new programs according to functional lines. Vessel traffic services (VTS), formerly a separate program, was expanded into the waterways management program with the addition of responsibilities for the rules of the road and other passive vessel traffic management measures.[3]

PASSIVE WATERWAYS MANAGEMENT

Passive measures for vessel traffic management include rules of the road, traffic separation schemes (TSS) and other vessel routing measures, speed limits, vessel operating restrictions, bridge-to-bridge radiotelephone communications, anchorage controls, and other regulations.[4] These responsibilities are carried out by the Coast Guard through participation on committees which develop international agreements on navigation, administration of rules and regulations on navigation in U.S. navigable waters, and dissemination of information on such rules and regulation. Publications prepared by the Coast Guard for use by mariners include

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[3] U.S. Department of Transportation. Coast Guard. Port and environmental safety operating program plan: Fiscal years 1983-92. G-WPE. Dec. 8, 1980, p. IV-5.

[4] An internal Coast Guard reorganization, effective Nov. 9, 1981, transferred certain passive vessel management responsibilities from the Office of Marine Environment and Systems to the Office of Navigation, removing these functions from the waterways management program and placing them in the short range aids to navigation program. Since most of this report was prepared prior to, and before the implementation of, this transfer, all passive vessel management measures which were under the waterways management program prior to Nov. 9, 1981, will be considered to be part of that program in this report.

"Navigation Rules" [5] and "Bridge to Bridge Radiotelephone Communications Laws and Regulations." [6] These publications are sold to users by the U.S. Government Printing Office and are revised and updated from time to time by the Coast Guard.

Under the Inland Navigational Rules Act of 1980,[7] the three previous sets of rules for inland waters, western rivers, and the Great Lakes were replaced by a new set of rules, specified in detail in the Act for Inland Waters and Western Rivers, to become effective December 24, 1981, 1 year after approval of the act. The effective date for the new rules on the Great Lakes is to be set in coordination with the Canadian Coast Guard. It is expected that agreement with Canada will be reached prior to April 1, 1982, when the Great Lakes navigation season begins.[8]

Navigation on the high seas is regulated by the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS), adopted in that year by the Inter-Governmental Maritime Consultative Organization (IMCO). These regulations also apply to all seagoing vessels in navigable waters connected to the high seas, with certain amendments which may be established by the countries in whose jurisdiction the connecting navigable waters may be located. The Coast Guard promulgates these rules and the inland rules for navigation and enforces the rules in waters of U.S. jurisdiction.

Another aspect of passive waterways management for which the Coast Guard has responsibility is the definition and administration of shipping fairways in the Gulf of Mexico and off the coast of California in the vicinity of offshore oil drilling rigs. The Coast Guard was directed by the Port and Tanker Safety Act of 1978 (33 U.S.C. 1221 et seq.) to establish these traffic lanes. The U.S. Army Corps of Engineers had effectively been maintaining such fairways in these areas through their policy of issuing permits for offshore structures, a responsibility which remains with the corps. Plans are underway to define new fairways, and the Coast Guard expects to issue regulations on fairways in the Gulf of Mexico early in calendar year 1982. Another function shared by the Corps of Engineers and the Coast Guard is the regulation of the "fleeting" of barges in the Mississippi River, a matter of concern for navigation, especially in cases where large fleets of barges are anchored at various locations in the river.[9]

ACTIVE WATERWAYS MANAGEMENT

The Coast Guard's vessel traffic services (VTS) is the active component of the waterways management program. VTS is an integrated system, encompassing a variety of techniques, equipment, and people employed to coordinate vessel movements in or approaching a port or waterway. Such a system uses all means available to reduce congestion in constricted areas and to minimize the

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[5] U.S. Department of Transportation. Coast Guard. Navigation rules; International—Inland. CG-169. Washington, U.S. Government Printing Office, May 1, 1977, 170 pages.

[6] U.S. Department of Transportation. Coast Guard. Bridge to Bridge Radio-Communications; Laws and Regulations. CG-439. Washington, U.S. Government Printing Office, Dec. 1, 1972, 36 pages.

[7] Public Law 96-591, signed Dec. 24, 1980 (33 U.S.C. 2001).

[8] Private communication. U.S. Coast Guard Office of Marine Environment and Systems, Waterways Managment Division. Nov. 12, 1981.

[9] Ibid.

element of surprise in marine encounters. Each component of a VTS is designed to derive information critical to safe navigation and to transmit such information to a vessel's master well in advance of its need. The system usually includes a communications network, an analysis and display component, a surveilance capability (using visual observations, closed-circuit low-light-level television, and radar), and a component of trained personnel.[10]

The Ports and Waterways Safety Act, signed into law July 10, 1972, authorizes the Coast Guard to establish, operate, and maintain vessel traffic services and systems for ports, harbors, and other waters subject to congested vessel traffic. A system in San Francisco Harbor, initiated in 1969 as a harbor advisory radar project, was commissioned as the first major Coast Guard VTS and began operations on August 22, 1972. A second VTS pilot program began operations in Puget Sound on September 25, 1972. Two comprehensive studies on VTS—the "Vessel Traffic System Issue Study"[11] and the "Vessel Traffic System Analysis of Port needs"[12]—were completed by the Coast Guard in 1973. The latter study examined 20 additional major U.S. ports and waterways in terms of annual losses due to vessel and cargo damage, property damage, pollution incidents, and deaths and injuries; and a port priority list was developed, based on these kinds of losses. Using a case-by-case analysis to estimate the effectiveness of VTS in reducing accidents and losses, the top-ranked ports were examined further, and cost/benefit analyses were conducted.

During the ensuing years, VTS's were developed and installed at Houston-Galveston in 1975; at New Orleans in 1977; and in Prince William Sound, at the southern terminous of the Trans-Alaska Pipeline, also in 1977. The New York VTS, originally scheduled to be operational by 1978, has not yet been completed owing to continued difficulty in obtaining a suitable computer-based information system.[13]

There are also three minor VTS's in operation: At Morgan City, La.; at Sault Sainte Marie, Mich.; and at Louisville, Ky. (operated seasonally). Other ports and waterways identified for possible installation of VTS are Chesapeake Bay, Delaware Bay, portions of the Gulf Intercoastal Waterway, and Tampa Bay. Current studies are in progress or are planned for the Chesapeake Bay, Tampa Bay, the Columbia River, and the lower Mississippi River.[14]

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[10] U.S. Coast Guard. Office of Marine Environment and Systems. Waterways Management Division. Briefing paper. June 4, 1981.

[11] U.S. Dept. of Transportation. Coast Guard. "U.S. Coast Guard Study Report. Vessel Traffic Systems Issue Study. Final Report." In four volumes (vol. 1, Executive Summary, 32 pages; vol. 2, Report on the Issues, 223 pages; vol. 3 Computer Sciences Corporation Report, 405 pages; vol. 4, Management Plan, 213 pages). Washington, D.C. March 1973.

[12] U.S. Dept. of Transportation. Coast Guard. "U.S. Coast Guard Study Report. Vessel Traffic Systems: Analysis of Port Needs." AS-770 710. Washington, D.C. August 1973, 73 pages.

[13] U.S. Coast Guard. Office of Marine Environment and Systems, Waterways Management Division. Briefing paper. Sept. 28, 1981.

[14] Ibid.

Information on the establishment, crew size, surveillance mode, installation and operating costs, casualty savings, and benefit-to-cost ratios is summarized in table 1 for the VTS systems currently in operation, and for the New York system, which is still under development. Data in the table were provided by the Coast Guard's Office of Marine Environment and Systems, Waterways Management Division.[15]

[15] Private communication. Nov. 16, 1981.

TABLE 1. Vessel Traffic Services Program Information. a/

PORT/WATERWAY	ESTABLISHED	CREW SIZE	ELECTRONIC SURVEILLANCE	ACQUISITION & CONSTRUCTION COST (AC&I)	ANNUAL OPERATING COST FY-81	AVERAGE ANNUAL CASUALTY COST "SAVED"	RATIO OF BENEFITS TO COSTS	NOTES:
HOUSTON/GALVESTON	2/75	46	YES	3.3M	1.81M	3.60M	1.48:1	
NEW ORLEANS	10/77	60	NO	3.9M	2.44M	3.47M	1.23:1	
NEW YORK	PENDING	58	YES	8.2M	1.81M	3.67M	1.40:1	>Estimated Benefits;VTS not operational.
PRINCE WILLIAM SOUND	7/77	12	YES	7.1M	.89M	*	*	>Established by Congressional action. No preventable casualties to date.
PUGET SOUND	9/72	63	YES	17.3M	2.56M	.82M	*	>Costs include installation, maintenance and operation of radar installed as part of US/CANADA Agreement for joint traffic management system.
SAN FRANCISCO	8/72	26	YES	5.8M	0.79M	1.17M	1.02:1	>Developed with RAD funds.
BERWICK BAY	1974	6	NO	0	.11M	*	*	>Average of 108 tows and barges transit this VTS each day carrying 24.5 million short-tons(68% petroleum and chemical) of cargo.
LOUISVILLE	1973	2	NO	0	.05M	*	*	>Average of 112 tows and barges carrying 7000 tons transit this VTS each day during periods of high water.
ST. MARYS RIVER	1897	8	YES	0	.15M	*	*	>Average of 42 vessels (up to 1000 ft.) transit this VTS each day. VTS also supports "Seasonal Extension" of the Great Lakes.

*Data Not Available

NOTES: (1) AC&I costs are actual costs, cumulative since 1972:
(a) AC&I costs for Prince William Sound include construction costs for Marine Safety Office Valdez, 28 family housing units and 20 person barracks.
(b) AC&I costs for San Francisco actually RDT&E funding and considered "sunk cost" for benefit cost computation. Equipment replacement estimated at $3.55M for benefit cost comparison.
(2) Average annual casualty cost "saved" adjust for FY81.
(3) Benefit/cost ratio computed for 10 year life cycle.

"BENEFITS" NOT QUANTIFIED:
-Facilitation of commerce.
-Reduction in potential for major catastrophe
(Cost of one casualty would impact significantly on estimate savings).

"COSTS PER CASUALTY" NOT QUANTIFIED:
-Property damage (shore-side) due to oil pollution or other hazardous substances.
-Clean-up cost.
-Impact on vulnerable resources (environmental concerns).
-Revenues forgone and other social costs.
-Annual casualty costs saved based on analysis and determination of preventablity of all casualties for a given VTS area from 1968-1972 (except Houston/Galveston and New York VTS which have been updated thru 1978 data) as published in the original Analysis of Port Needs study.

a/ Information provided by U.S. Coast Guard, Office of Marine Environment and Systems, Waterways Management Division. November 16, 1981.

A comprehensive study of the VTS in the Houston-Galveston area was completed recently by the Coast Guard.[16] The purpose of this study, the first of a number planned for the various operational VTS systems, was to validate VTS study methods and assumptions and to assess the effectiveness of the Houston-Galveston system. It was concluded that, although the system is voluntary, it has been effective and that the benefit-to-cost ratio is 2.2 to 1, that is, for every dollar spent on the VTS, there is a gain of $2.20 in terms of casualties prevented. It was also concluded that mandatory participation is required to realize the full potential of the Houston-Galveston VTS system.[17]

Bases for Responsibilities for the Waterways Management Program

The Coast Guard is authorized to administer and enforce the various rules and regulations relating to waterways management in navigable waters of the United States in accordance with a number of statutes, Executive orders, and international agreements. Federal authorities for these responsibilities are listed in the following sections for active and passive vessel traffic management.

AUTHORITIES FOR PASSIVE VESSEL TRAFFIC MANAGEMENT

The Coast Guard promulgates a number of rules and regulations commonly referred to as the "rules of the road." International rules apply and are enforced on all U.S. shipping seaward of established demarcation lines. Inland rules apply and are enforced in all U.S. harbors, rivers, and other inland waters. They will also apply to the Great Lakes and their connecting and tributary waters when an agreement is worked out with Canada. Meanwhile, specific rules for the Great Lakes are in effect. Specific authority for Coast Guard enforcement of the "rules of the road" are the following:

33 U.S.C. 151–232 Establish the inland rules of the road and authorize the Coast Guard to establish demarcation lines and enforce these rules.

33 U.S.C. 241–295 Establish the Great Lakes rules of the road and authorize Coast Guard to enforce.

33 U.S.C. 301–355 Establish the western rivers rules of the road and authorize Coast Guard to enforce.

33 U.S.C. 356, 360, 360a Authorize exemptions for Coast Guard and naval vessels.

33 U.S.C. 1601–1608 Establish the international rules of the road and authorize the Coast Guard to promulgate and enforce implementing regulations.

33 U.S.C. 2001–2073 The Inland Rules Act of 1980 was signed into law December 24, 1980, superseding the old inland rules, western rivers rules, the Great Lakes rules, their respective pilot rules, and parts of the Motorboat Act of 1940. The new rules will go into effect on all U.S. inland waters, except the Great Lakes, on December 24, 1981. The effective date for

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[16] U.S. Dept. of Transportation. Coast Guard. Office of Research and Development. "Vessel Traffic Services: Houston/Galveston VTS Casualty Analysis. Final Report." Washington, D.C. August 1981, 110 pages.

[17] Ibid., p. 3.

the Great Lakes will be set in coordination with the Canadian Coast Guard. When this act is fully effective, provisions of the other statutes listed above will be terminated or modified.

The Coast Guard has extensive authority, as indicated by the list of statutes below, to control the anchorage of vessels in U.S. waters and the lighting of vessels while at anchor.

14 U.S.C. 2 States that one of the primary duties of the Coast Guard is to administer the laws and promulgate and enforce regulations for the promotion of safety of life and property on and under the high seas and waters subject to the jurisdiction of the United States.

14 U.S.C. 91 Authorizes the Coast Guard to control the anchorage and movement of vessels in the territorial waters of the United States to insure the safety and security of U.S. naval vessels.

14 U.S.C. 631 Authorizes the Secretary to delegate his powers to the Commandant, Coast Guard, for its administration.

14 U.S.C. 633 Authorizes the Coast Guard to promulgate appropriate regulations.

33 U.S.C. 180 Prescribes required lights of vessels at anchor—inland waters.

33 U.S.C. 258 Prescribes required lights of vessels at anchor—Great Lakes.

33 U.S.C. 322 Prescribes required lights of vessels at anchor—western rivers.

33 U.S.C. 471 Generally authorizes the Coast Guard to define and establish anchorage grounds and to prescribe suitable regulations therefor.

33 U.S.C. 472 Generally authorizes the Coast Guard to mark anchorage grounds.

33 U.S.C. 474 Generally authorizes the Coast Guard to prescribe anchorage and general regulations for Saint Mary's River.

33 U.S.C. 1221 Generally authorizes the Coast Guard to direct the anchoring of a vessel to prevent damage to vessels, bridges, and other structures or for the protection of the navigable waters from environmental harm.

When the President declares a national emergency or determines that the security of the United States is endangered, the Coast Guard is further authorized by the following statutes to regulate the control, anchorage, or movement of vessels for the purpose of insuring the security of U.S. ports:

50 U.S.C. 191 Generally authorizes the Coast Guard to regulate the anchorage and movement of vessels during national emergency or when the security of the United States is endangered.

50 U.S.C. 192 Authorizes the seizure and forfeiture of a vessels, a fine, and imprisonment for failing to comply with Coast Guard regulations or orders.

Specified classes of U.S. vessels are required to carry radiotelephone equipment capable of operation from navigation bridges for the exchange of navigational information. The Coast Guard is responsible for administering and enforcing this requirement, pre-

scribed under the following law, known as the Vessels Bridge-to-Bridge Communications Act:

33 U.S.C. 1201-1208 Generally require the presence of an operating radiotelephone on the navigational bridge of specified vessels and authorize the imposition of civil penalties for violations.

AUTHORITY FOR ACTIVE VESSEL TRAFFIC MANAGEMENT

The Coast Guard is authorized to operate vessel traffic services in ports and other waters subject to congested vessel traffic and may require compliance with regulations specifying time of vessel movement, routing scheme, operating constraints on size and speed, installation of electronic devices, and pilotage, in accordance with the following:

33 U.S.C. 1221-1227 Authorizes the Coast Guard to take a variety of actions, including the establishment of vessel traffic control systems to prevent damage to vessels, bridges, or other structures and to protect the navigable waters of the United States from environmental harm, to promulgate necessary rules and regulations, to impose civil penalties, and to seek criminal sanctions.

Resource Requirements for the Waterways Management Program

The largest portion of the annual costs for the waterways management program is associated with the vessels traffic services. According to the information provided in table 1, the annual operating costs for these services for fiscal year 1981 was $10.6 million. Total staffing for the program is about 250 people. In addition to operational costs, headquarters and district personnel costs amount to about $190,000 annually, not shown in table 1. Approximate annual costs for the passive waterways management activities will amount to about $250,000 for fiscal year 1981; of this amount, about $150,000 covers salaries, while the remainder is used for various projects. The costs of printing and distributing publications such as navigation rules, once borne by the Coast Guard, are now recovered, since the rules are now sold by the U.S. Government Printing Office.[18]

Annual resource requirements for the waterways management program are given in table 2, in terms of man-hours, for the program elements and the associated program criteria. In addition to man-hour needs, operation of the VTS also requires 135 cutter days on an annual basis. This cutter service is needed to enforce the compliance with the VTS system in Puget Sound, one of the few mandatory VTS systems. The data in table 2 represent program performance at level C.

[18] Private communication. U.S. Coast Guard. Office of Marine Environment and Systems, Waterways Management Division. Nov. 12, 1981.

Program Standard for the Waterways Management Program

ESTABLISHMENT OF THE PROGRAM STANDARD

The program standard for the waterways management program was developed by the Division of Waterways Management of the Coast Guard's Office of Marine Environment and Systems. Criteria in support of the four major program elements, or goals, were established on the basis of current operational capabilities and requirements and on extrapolations of these capabilities and requirements to an optimum level where the Coast Guard feels it ought to be operating in this program. Table 3 shows the annual resource requirements, in terms of man hours, and in terms of cutter days in the case of the operation of VTS systems, for the various criteria which make up the program standard—level A—for each of the four goals or program elements. The table also shows the increased man-hours needed to attain level A from the current performance level (level C). (Compare table 3 with table 2, which gives current performance requirements.)

TABLE 2. Current Annual Resource Requirements (Level C) for the Coast Guard Waterways Management Program a/

Program Element	Criteria	Resource Requirements (man-hours)
A. Minimize the damage to vessels, property and personnel, and assist the safe and economic flow of waterborne commerce by providing information on conditions to vessels or by controlling, supervising, and separating vessel traffic.	Establish port access routes.	7,680
	Review and amend as necessary offshore routing measures.	1,920
	Operate VTS at selected locations.	573,532 b/
B. Reduce the number of vessel collisions, groundings and rammings resulting from lack of familiarity with, lack of compliance with, or inherent inadequacies in rules and regs. pertaining to navigational safety and the movement of vessels.	Enact Unification of Rules of the Road Package.	1,040
	Develop Amendments to '72 COLREGS. c/	100
	Provide for adequate distribution of CG-169. d/	1,500
	Provide sufficient VHF-FM monitoring resources for enforcement of the Bridge-to-Bridge Radiotelephone Act.	5,340
	Coordinate the activities of and chair the RORAC. e/	100
	Coordinate the activities of and chair the SOLAS working group. f/	75
	Represent the US at Sub. Nav. g/	130
C. Review reports of casualties which result in the loss or damage to vessels, barges or personnel and identify situations where changes in procedures, regulations or level of knowledge would reduce damages resulting from such accidents.	Change procedures/regulations (e.g. Navigation Safety Regulations, 33CFR164) as required in light of operational experience.	2,080

TABLE 2. Current Annual Resource Requirements (Level C) for the Coast Guard Waterways Management Program a/ -- Continued

Program Element	Criteria	Resource Requirements (man-hours)
D. Minimize the adverse impact upon waterborne commerce in ports and waterways resulting from lack of knowledge, planning or cooperative effort by maintaining liaison and contact with media, the public industry and officials in other agencies.	Promote public education concerning waterway safety matters by speaking at public gatherings and contributing to professional publications.	100
	Provide adequate administration and management for all aspects of the waterways safety program.	18,964

NOTES:

a/ Adapted from U.S. Coast Guard Waterways Management Operating Program Plan: FY 83-92. p. V-1 to V-3.

b/ Resource requirements for this criterion also include 135 days of cutter time to enforce compliance with the Puget Sound VTS, one of the mandatory VTS systems.

c/ International Regulations for Preventing Collisions at Sea, 1972.

d/ U.S. Coast Guard. Navigation Rules: International - Inland. CG-169. May 1, 1977.

e/ Rules of the Road Advisory Committee.

f/ Safety of Life at Sea.

g/ Subcommittee on Navigation of the UN Inter-Governmental Maritime Consultative Organization.

TABLE 3. Performance Level Requirements for Program Standard (Level A) for Waterways Management Program and Resource Changes from Current Performance (Level C) a/

Program Element	Criteria	Annual Resource Requirement (Level A) (man-hours)	Resource Change from Level C (man-hours)
A. Minimize the damage to vessels, property, and personnel, and assist the safe and economic flow of waterborne commerce by providing information on conditions to vessels or by controlling, supervising, and separating vessel traffic.	Establish port access routes.	11,520	3,840
	Review and amend as necessary offshore routing measures.	3,840	1,920
	Provide automated vessel information systems and consolidated VTC displays at VTS's.	---	---
	Install closed circuit TV to reduce collisions and rammings in the areas of Houston Ship Channel which are not covered by the present VTC installation.	29,910	29,910
	Operate VTS at selected locations.	603,442 b/	29,910
B. Reduce the number of vessel collisions, groundings and rammings resulting from lack of familiarity with, lack of compliance with, or inherent inadequacies in rules and regs. pertaining to navigational safety and the movement of vessels.	Enact Unification of Rules of the Road Package.	2,080	1,040
	Develop Amendments to '72 COLREGS. c/	100	---
	Provide for adequate distribution of CG-169. d/	1,920	420
	Provide sufficient VHF-FM monitoring resources for enforcement of the Bridge-to-Bridge Radiotelephone Act.	5,760	420

TABLE 3. Performance Level Requirements for Program Standard (Level A) for Waterways Management Program and Resource Changes from Current Performance (Level C) a/ -- Continued

Program Element	Criteria	Annual Resource Requirement (Level A) (man-hours)	Resource Change from Level C (man-hours)
	Coordinate the activities of and chair the RORAC. e/	200	100
	Coordinate the activities of and chair the SOLAS working group. f/	100	25
	Represent the US at Sub. Nav. g/	180	50
C. Review reports of casualties which result in the loss or damage to vessels, barges or personnel and identify situations where changes in procedures, regulations or level of knowledge would reduce damages resulting from such accidents.	Change procedures/ regulations (e.g. Navigation Safety Regulations, 33CFR164) as required in light of operational experience.	3,120	1,040
	Determine cost-effective means of reducing property damage caused by vessels wakes.	1,688	1,688
	Pursue special projects and one-time studies relating to waterways safety.	1,688	1,688
D. Minimize the adverse impact upon waterborne commerce in ports and waterways resulting from lack of knowledge, planning or cooperative effort by maintaining liaison and contact with media, the public industry and officials in other agencies.	Promote public education concerning waterway safety matters by speaking at public gatherings and contributing to professional publications.	1,080	980
	Provide adequate administration and management for all aspects of the waterways safety program.	27,004	8,440

TABLE 3. Performance Level Requirements for Program Standard (Level A) for Waterways Management Program and Resource Changes from Current Performance (Level C) a/ -- Continued

NOTES:

a/ Adapted from U.S. Coast Guard Waterways Management Operating Program Plan: FY 83-92. p. V-1 to V-3.

b/ Resource requirements for this criterion also include 135 days of cutter time to enforce compliance with the Puget Sound VTS, one of the mandatory VTS systems.

c/ International Regulations for Preventing Collisions at Sea, 1972.

d/ U.S. Coast Guard. Navigation Rules: International - Inland. CG-169. May 1, 1977.

e/ Rules of the Road Advisory Committee.

f/ Safety of Life at Sea.

g/ Subcommittee on Navigation of the UN Inter-Governmental Maritime Consultative Organization.

DISCUSSION OF THE PROGRAM STANDARD

While there are no criticisms of the program standard per se for either the passive or the active aspects of the waterways management program, there have been complaints about some of the rules used in passive vessel management and there have been questions about the need for VTS systems in certain waterways.

The National Transportation Safety Board (NTSB) has argued for a tightening of standards, for example, for lights on vessels in the inland rules of the road, making them conform more nearly with the international rules. This contention may be alleviated with introduction of the new inland rules to be implemented December 24, 1981, in accordance with Inland Navigational Rules Act of 1980.[19] The NTSB has also supported more specific requirements with regard to bridge-to-bridge radiotelephone communications. New rules on bridge-to-bridge communications will reduce these complaints somewhat, since more vessels must comply with these requirements; however, use of such communication gear will still not be mandatory.[20]

In a 1979 study, the U.S. General Accounting Office (GAO) concluded that "the Coast Guard did not evaluate simpler, less costly alternatives for vessel traffic management before establishing vessel traffic service systems in the ports of New York, New Orleans, and Houston. This has resulted in unnecessary expense to the Government and increased burdens on mariners and the Coast Guard."[21] The report recommended that the Coast Guard should make sure that "vessel traffic service systems are the least costly and most efficient systems to promote safety and facilitate commerce."[22]

In its response, the DOT rejected the GAO conclusion and recommendation on VTS, saying:

> To hold in 1979 the position that the United States should not be engaged in active vessel traffic management is to ignore the whole body of domestic and international testimony and experience to the contrary. By any measure, New York Harbor, the lower Mississippi River, and the Houston Ship Channel are the most hazardous waterways in the Nation. To date, the Administration and the Congress have been in complete agreement concerning the efficacy of establishing vessel traffic services in these areas. The legislative history of the Ports and Waterways Safety Act of 1972 clearly establishes the congressional intent for the Coast Guard to undertake the construction and manning of vessel traffic service.[23]

The Department cited GAO's earlier 1975 study on the VTS[24] in which it had found that VTS systems were needed in New York, New Orleans, and Houston-Galveston, and criticized the Coast Guard for limiting its VTS plans to six ports, recommending that VTS be constructed in several other ports and waterways instead

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[19] Public Law 96-591, signed Dec. 25, 1980 (33 U.S.C. 2111). See earlier discussion under program description of passive waterways management.

[20] Private communication. USCG. Office of Marine Environment and Systems. Waterways Management Division. Nov. 12, 1981.

[21] Comptroller General of the United States. "Coast Guard Action Needed to Promote Safer Marine Transportation." Report to the Congress. CED-79-37. Washington, D.C., U.S. General Accounting Office, May 21, 1979, p. ii.

[22] Ibid., p. iii.

[23] Ibid., 59.

[24] Comptroller General of the United States. "Vessel Traffic Systems—What is Needed to Prevent and Reduce Vessel Casualties? A Report to the Congress." RED-75-319. Washington, D.C., U.S. General Accounting Office, Jan. 21. 1975.

of adding surveillance equipment in New York, New Orleans, and Houston-Galveston in the initial phase. The Department recognized that the 1975 GAO report had recommended that the Coast Guard give national emphasis to passive vessel traffic management measures, but not with the intent of deferring construction of VTS systems in those areas which had been initially identified as needing them.[25]

The Transportation response to the 1979 GAO report asserted that:

> To categorize the Coast Guard's actions over the past four years as "proceeding along a steady course of poor management" is incorrect, unfair, and prejudicial to the Department's position . . . The draft report is clearly inconsistent with the 1975 report in its findings and conclusions and should be either withdrawn or substantially restated.[26]

With regard to the GAO recommendation on VTS, the Department noted that the Coast Guard "has determined first if passive vessel traffic management measures represent a feasible alternative to the operation of a VTS. The Coast Guard believes that its current policy is consistent with (the) recommendation." [27] The GAO replied, however, stating that:

> We disagree with the Coast Guard's position that its current policy complies with our recommendation. The record shows that the Coast Guard has not, except to a limited extent in New York Harbor, implemented and tested less costly alternatives to a VTS system to determine whether a simpler and more cost-effective method of preventing or reducing marine casualties is available.[28]

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[25] Comptroller General of the United States. "Coast Guard Action Needed to Promote Safer Marine Transportation." 1979, p. 59.
[26] Ibid.
[27] Ibid., p. 35.
[28] Ibid.

TABLE 4. Vessel Traffic Service Hardware Replacement Schedule, as of June 3, 1981, Based on an Average 10-Year Life Cycle a/

Equipment Category	Present Equipment	Own	Mgr	Year Installed	End of Life	Qty Req'd	Cost ea ($K)	Instl ea($K)	Tot Cost	Fund	Replacement Schedule (Annual Cost $K) FY81$ 81	82	83	84	85	86	87	88	89	90	91	92
San Fran VTS	Comms	CG	WWW	72	83	1	200	50	250	ACAI	250	0	0	0	0	0	0	0	0	0	0	0
San Fran VTS	Micro & RRS	CG	WWW	72	83	1	300	100	400	ACAI	400	0	0	0	0	0	0	0	0	0	0	0
San Fran VTS	Radar	CG	WWW	72	83	2	1300	300	3200	ACAI	3200	0	0	0	0	0	0	0	0	0	0	0
Houston VTS	Comms	CG	WWW	75	05	1	300	50	350	ACAI	0	0	350	0	0	0	0	0	0	0	0	0
Houston VTS	RRS	CG	WWW	77	87	1	400	100	500	ACAI	0	0	0	0	500	0	0	0	0	0	0	0
Houston VTS	Radar	CG	WWW	77	87	1	1300	300	1600	ACAI	0	0	0	0	1600	0	0	0	0	0	0	0
Houston VTS	CCTV	CG	WWW	81	91	7	350	50	2800	ACAI	0	0	0	0	0	0	0	0	0	2800	0	0
Houston VTS	Computer	CG	WWW	77	87	1	2000	500	2500	ACAI	0	0	0	0	2500	0	0	0	0	0	0	0
Bolo VTS	Comms	CG	WWW	77	87	1	400	100	500	ACAI	0	0	0	0	500	0	0	0	0	0	0	0
Bolo VTS	Microwave	CG	WWW	77	87	1	400	100	500	ACAI	0	0	0	0	500	0	0	0	0	0	0	0
Bolo VTS	Radar	CG	WWW	82	92	1	1300	300	1600	ACAI	0	0	0	0	0	0	0	0	0	0	0	1600
Bolo VTS	Computer	CG	WWW	77	86	1	2000	500	2500	ACAI	0	0	0	2500	0	0	0	0	0	0	0	0
New York VTS	Comms	CG	WWW	79	89	1	500	100	600	ACAI	0	0	0	0	0	0	600	0	0	0	0	0
New York VTS	Micro & RRS	CG	WWW	79	89	1	500	100	600	ACAI	0	0	0	0	0	0	600	0	0	0	0	0
New York VTS	Radar	CG	WWW	78	88	2	1300	300	3200	ACAI	0	0	0	0	0	3200	0	0	0	0	0	0
New York VTS	CCTV	CG	WWW	79	89	5	350	50	2000	ACAI	0	0	0	0	0	0	2000	0	0	0	0	0
New York VTS	Computer	CG	WWW	82	92	1	4000	500	4500	ACAI	0	0	0	0	0	0	0	0	0	0	0	4500
Puget Sound VTS	Comms	CG	WWW	81	91	1	350	100	450	ACAI	0	0	0	0	0	0	0	0	0	450	0	0
Puget Sound VTS	Microwave	CG	WWW	80	90	1	5000	1000	6000	ACAI	0	0	0	0	0	0	0	0	6000	0	0	0
Puget Sound VTS	Radar	CG	WWW	80	90	10	1300	300	16000	ACAI	0	0	0	0	0	0	0	0	16000	0	0	0
Valdez VTS	Comms	CG	WWW	77	87	1	200	100	300	ACAI	0	0	0	0	300	0	0	0	0	0	0	0
Valdez VTS	Microwave	CG	WWW	77	87	1	1000	300	1300	ACAI	0	0	0	0	1300	0	0	0	0	0	0	0
Valdez VTS	Radar	CG	WWW	77	87	2	1300	300	3200	ACAI	0	0	0	0	3200	0	0	0	0	0	0	0

a/ Data from U.S. Coast Guard. Office of Marine Environment and Systems. Waterways Management Division. Private communication. June 3, 1981.

COAST GUARD NEEDS TO MEET THE PROGRAM STANDARD

The manpower increases which the Coast Guard asserts are required to move from the current performance level, level C, to the program standard, level A, are given in the last column of table 3 above. In addition, there are specific hardware replacements identified as needed for the various VTS systems now in operation or under construction. Currently underway are improvements and expansions to the communications system in the Puget Sound VTS, which was installed in 1971–72. Major replacements are anticipated in the San Francisco VTS, the oldest of the systems, in the 1983–84 timeframe. A tentative hardware replacement schedule, with associated equipment costs, for the six major VTS systems for the fiscal year 1983 through 1992 period is given in table 4. No new VTS systems are currently contemplated though several studies, as noted earlier, are underway. The kinds of hardware used for replacement in current VTS systems or those which might be installed in the future could change over the next 10 years as new technology becomes available and as the VTS research and development program identifies changing requirements and applications of new technology.

MODIFICATION OF THE WATERWAYS MANAGEMENT PROGRAM AND POSSIBLE TRANSFER OF FUNCTIONS

There have been various suggestions on modifying aspects of both active and passive portions of the vessel traffic management responsibilities, administered under the Coast Guard's waterways managment program; however, most questions and recommendations have been raised in connection with installation and operation of the VTS systems. This is understandable since nearly all funds expended in the program are associated with VTS. The OMB has repeatedly, especially at the beginning of each recent administration, asked the Coast Guard whether and to what extent the Federal Government and the Coast Guard in particular should be responsible for operating VTS systems.

During preparation for a recent budget submission, the Coast Guard examined several issues relevant to this general question often raised by OMB.[29] Each of these issues is stated as a question below, along with Coast Guard findings on the issue determined from its analysis.

1. What should be the local and Federal roles in establishing, operating, and maintaining VTS's?

Conclusions

1. Commonality among VTS's in ports and waterways througout the Nation is absolutely essential. This is best achieved under Federal administration of the VTS program.

2. In many areas international considerations preclude local authorities from involvement in system establishment.

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[29] U.S. Coast Guard. Briefing document. "DOT fiscal year 1979 Preview—Coast Guard Vessel Traffic Services (VTS)"—Issue 4, 1977.

3. Complications over interstate commerce suggest Federal exclusivity in VTS.

4. The expansion of non-Federal roles in VTS establishment and operation will entail significant additional costs for design review, permit approval, and operational oversight.

5. Without strong inducements, local entities and States appear unlikely to enter the VTS field, as evidenced by the fact that no local or State authority has expressed serious interest in the recent past.[30]

2. If one or all of the functions of establishing, operating, and maintaining VTS's were transferred to local authorities, how should this be accomplished?

Conclusions

1. Some areas can be dropped from consideration for locally established and/or operated VTS due to international considerations.

2. Although various combinations of Federal and local roles in VTS are technically feasible none of them represent practical approaches.

3. Some residual licensing and oversight functions would have to be formed and staffed at the Federal level to review and oversee local VTS establishment and operation.

4. New mechanisms must be developed to allow for coordination, sharing and preemption of authority by captains of the port (COTP's) concerning anchorage administration and port safety and security with local VTS's.[31]

3. If VTS is a Federal responsibility, how should it be staffed?

Conclusion

It should take more personnel and cost more to staff a VTS unit with civilians. There are advantages and disadvantages to each approach. On balance, at least for the immediate future, military manning better meets overall needs. The issue is not closed, however, and further analysis of civilian manning will continue.[32]

A fourth question taken up in the Coast Guard analysis did not address who ought to operate the VTS system, but was concerned rather with the extension of VTS into other areas:

4. Should there be a moratorium on VTS's pending determination of the effectiveness of those systems under construction or currently operated?

Conclusions

1. A de facto moratorium exists on VTS, since present Coast Guard plans based on existing criteria call for no new system starts in fiscal year 1978 and 1979.

[NOTE.—This situation has continued to exist through fiscal year 1982.]

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[30] Ibid., pp. 7–8.
[31] Ibid., pp. 10–11.
[32] Ibid., p. 15.

2. Original estimates of VTS effectiveness appear realistic. In all areas with operational VTS's, the number of collisions, the amount of monetary damages resulting from vessel casualties, and the number of deaths and of injuries have decreased since VTS commissioning.

3. Total vessel navigational casualties, which include rammings and groundings that are usually not amenable to prevention by VTS, have increased in two of the three areas with operational VTS's.

4. In Houston-Galveston, the one area studied in detail, VTS has made a significant contribution to waterway efficiency.

5. Better techniques to measure more accurately operational VTS effectiveness are under development.[33]

In view of the consideration of these questions and the stated conclusions, the following recommendations were made by the Coast Guard at that time regarding VTS:

—The VTS program should continue to be federally administered and funded and non-Federal involvement should not be encouraged.

—The VTS units should continue to be staffed with Coast Guard military personnel.

—In future VTS implementations the normal budgetary process should be followed with justification based on Coast Guard planning criteria.[34]

There are no recent cases where local governments or other authorities have offered or requested authority to operate VTS systems. In one instance a local authority requested that the Coast Guard install a VTS system, but did not wish to have responsibility for its operation and maintenance. A mini-VTS was requested by the causeway commission for Lake Pontchartrain in Louisiana to protect human life and avoid causeway damage by preventing ship-causeway collisions. The Coast Guard considered the feasibility of the VTS unit but did not proceed with development of the system in view of the commission's unwillingness to operate the VTS.[35]

Recently, the Coast Guard was directed to perform an in-house feasibility analysis of what could be appropriate roles for private contractors in the operation of a VTS facility, in accordance with the guidelines of OMF Circular A-76. The New York Harbor VTS was chosen as the subject of the requested study, which also examined possible operation by States, municipalities, and the local port authority. The preliminary finding of this analysis is that operation of the New York Harbor VTS is a proper function of the Federal Government.[36]

It is possible that, under certain limited circumstances, active vessel traffic management systems could also be installed and operated by private firms. An example of a privately operated system similar to VTS is found at Long Beach, Calif., where Jacobson Pilot Service operates an active vessel management system for its own pilots, using radio and a radar set.[37] Because of commonality re-

[33] Ibid., p. 19.
[34] Ibid., pp. 8, 15, and 19.
[35] Private communication. U.S. Coast Guard, Office of Marine Environment and Systems, Waterways Management Division. Nov. 12, 1981.
[36] Ibid.
[37] Ibid.

quirements and other considerations discussed above in a Coast Guard analysis of who should operate VTS units, operation for major harbors by private concerns does seem feasible. It is conceivable, however, that Government-owned VTS systems might be operated someday, at least in part, under contract by private industry.

It was noted earlier that some passive vessel management responsibilities are being assumed by the Coast Guard from the Army Corps of Engineers. In particular, such responsibilities include maintenance of fairways or traffic lanes in the Gulf of Mexico and off the California coast and the regulation of the "fleeting" of barges in the Mississippi River. Various groups have proposed that the Coast Guard also assume responsibility for permitting offshore structures, now a responsibility of the Corps of Engineers, since the location of such structures is related to fairway maintenance and administration of vessel separation schemes.

There is reluctance of State and local governments to assume responsibility for vessel traffic management measures now administered by the Coast Guard. However, there are instances where the States have been concerned that they have sufficient input into the determination of regulations and shipping lanes. Currently, the California Coastal Commission, a State agency, has expressed its opinion that the State may rightfully establish more stringent standards for vessel traffic lanes than those developed by the Coast Guard. The commission contends that it should review Coast Guard plans for traffic lanes and vessel separation schemes and Coast Guard recommendations to the Corps of Engineers permitting of offshore structures to insure consistency of these decisions with the California coastal management program. This program has been approved by the U.S. Department of Commerce, which administers the Federal Coastal Zone Management Act, a section of which requires that Federal Activities must be consistent with federally approved State coastal management plans. The Coast Guard has permitted review of its port access plans by the California Coastal Commission and received comments from the commission on specific routes, though the question of ultimate authority on traffic standards remains unresolved. Another case of Federal-State controversy over vessel traffic standards is the continuing debate between the Coast Guard and the State of Washington over size limitations of tankers permitted to enter Puget Sound.[38]

[38] Ibid.

BRIDGE ADMINISTRATION PROGRAM*

Background and Program Description

The objective of the bridge administration program, according to the most recent operating program plan, is "to ensure safe and reasonably unobstructive navigation through or under bridges spanning the navigable waters of the United States, while meeting the needs of other transportation modes and protecting the human environment." [1]

The bridge administration program includes bridge lighting for navigation, drawbridge operation regulations, approval of location and plans, and alteration of bridges which are found to be unreasonable obstructions to navigation due mainly to changes in the navigation requirements on various waterways. There are two aspects to the program: First, a preventive approach, and second, a remedial approach. The preventive approach is intended to assure that the reasonable needs of navigation will be provided as a result of the processes of approval of location and plans of proposed bridges and deviation of plans for existing bridges. Regulations for operation of drawbridges are both preventive and remedial, assuring that ordinary low-level drawbridges are operated so as to provide for the reasonable needs of both navigation and land transportation. The lighting of bridges is also a preventive measure intended to facilitate passage at night.[2]

The principal remedial authority is derived from the Truman-Hobbs Act (13 U.S.C. 511), under which a lawful bridge may be altered at public expense if it is determined that the bridge obstructs navigation in an unreasonable way as a result of changes in the needs of navigation. In these instances, expenditure of public funds is restricted to those costs of alteration related to navigation needs.[3]

The goals of this double approach in the bridge administration program are to assure that:

> Bridges over navigable waters of the United States are constructed, maintained, and operated so as to provide for the reasonable needs of navigation; and
>
> Bridges which are found to be unreasonable obstructions are altered or removed.[4]

Bridge permits are required to insure that the construction of new bridges and the modification of existing bridges provide for the reasonable needs of navigation. Bridge statutes require that all

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*Prepared by Robert E. Morrison, specialist in marine science, Science Policy Research Division.

[1] U.S. Dept. of Transportation. Coast Guard. "Bridge Administration Operating Program Plan: fiscal years 1983–92," p. 1.

[2] U.S. Coast Guard. "U.S. Coast Guard Military Personnel Requirements." (Report to the Department of Transportation and the Office of Management and Budget.) October 1980, p. OP–2.

[3] Ibid.

[4] Ibid.

bridges constructed across navigable waters of the United States receive approval from the Coast Guard. Geographic location of a bridge and complexities of the relationships between a bridge and navigation affect the time required to process permits. There is currently a large backlog of permit applications, owing to the limited resources available for processing permits, and there is an anticipated increase in permit applications.[5]

Bridge statutes also require the removal or alteration of a bridge determined to be unreasonably obstructive to navigation. With the consolidation and merger of railroads and abandonment of service under the Regional Rail Reorganization Act of 1973, it is anticipated that a number of railroad bridges will be abandoned and require removal. There is also a current backlog of cases requiring investigation to determine if bridges are unreasonably obstructive to navigation and hence need to be removed or altered with funds provided under the Truman-Hobbs Act. It is further assumed that, as vessel size increases and more inland ports are developed to accommodate ocean traffic and domestic commerce, more bridges will become obstructive and require attention. It is projected by the Coast Guard that investigations will lead to the alteration of two to five bridges per year.[6] The trends in workload under the bridge administration program for fiscal years 1975 through 1979, in terms of permits, drawbridge regulations, and Truman-Hobbs grants for alterations, are shown in table 1.

TABLE 1.—WORKLOAD TRENDS FOR BRIDGE ADMINISTRATION PROGRAM, FISCAL YEARS 1975–79 [1]

Function and action	Fiscal year—					
	1975	1976	1977	1978	1979	Pending 1979
Permits—issued or denied	210	220	275	245	242	193
Drawbridge regulations—issued	41	46	31	30	23	68
Truman-Hobbs:						
Orders to alter served	4	1	3	1	2	19
Alterations commenced	1	3	2	1	1	

[1] From Coast Guard Bridge Administration operating program plan: fiscal years 1983–92, p. 8.

Statistics for activities under this program during fiscal year 1980 are given below: [7]

Statistics (fiscal year 1980)

Total number of bridges across U.S. navigable waters	[1] 18,000
Bridge permits issued	186
Drawbridge regulations issued	23
Bridge alterations completed	1

[1] Approximate.

Complete statistics on the bridge alteration projects administered under this program between April 1, 1967, when the program was transferred to the DOT from the Army Corps of Engineers, through March 31, 1981, are as follows: [8]

[5] U.S. Coast Guard. "Bridge Administration Program Plan: fiscal year, 1983-92," p. 7.
[6] Ibid.
[7] U.S. Coast Guard. Bridge Administration (quarterly report). Sept. 30, 1981, p. 1.
[8] Ibid.

Bridge alteration projects transferred to administration of Coast Guard with orders to alter	8
Orders to alter issued by Coast Gurad on basis of investigations conducted by Corps of Engineers	4
Orders to alter issued by Coast Guard on basis of investigations conducted by Coast Guard	12
Bridge alterations completed	18
Alteration projects under construction	3
Alteration projects pending construction. (oders/agreement to alter issued)	4
Bridge cases under investigation	6

Bases for Responsibilities for the Bridge Administration Program

The Coast Guard is authorized to administer and enforce various laws preserving the public right of navigation on navigable waters of the United States by assuring that all bridges over navigable waters are constructed, maintained, and operated in such a way as to provide for reasonable needs of navigation. The following Federal statutes are the bases for this authority:

33 U.S.C. 401 Generally provides for the Coast Guard to approve the plans and issue a permit for the construction of bridges and causeways.

33 U.S.C. 491–498 Contain the provisions of the Bridge Act of 1906 and authorize the Coast Guard to enforce provisions to prevent the unreasonable obstruction of navigation.

33 U.S.C. 499 Authorizes the Coast Guard to regulate drawbridges.

33 U.S.C. 502 Authorizes criminal sanctions for the failure to alter a bridge obstructing navigation.

33 U.S.C. 511–524 Authorize the Coast Guard to administer a grant program for the alteration of obstructive bridges (Truman-Hobbs Act).

33 U.S.C. 525–534 Contain the provisions of the General Bridge Act of 1946 providing for the construction and operation of bridges; consent of Congress; and approval of plans by the Coast Guard.

33 U.S.C. 535–535i Contain the provisions of the International Bridge Act of 1972, the administration of which has been delegated to the Coast Guard.

Prior to 1967, all public laws referring to bridge administration for purposes of navigation were administered by the U.S. Army Corps of Engineers. In that year, however, along with many other transportation programs, these responsibilities were transferred, under the DOT Act of 1966 (49 U.S.C. 1651 et seq.) to the Coast Guard.

Regulations relating to performance by the Coast Guard of functions which were formally the responsibilities of other agencies before establishment of the DOT are contained in 49 CFR 1.45 and 1.46. Specific regulations on the various laws listed above on bridge administration for purposes of navigation are found in 33 CFR 114 through 118 (subchapter J). Within subchapter J, 33 CFR 115 states administrative procedures for bridge location and clearance, 33 CFR 116 covers alteration of obstructive bridges, 33 CFR 117 con-

tains drawbridge operation regulations, and 33 CFR 118 gives information and guidance on bridge lighting.

Resource Requirements for the Bridge Administration Program

Resources requirements for the Coast Guard's bridge administration program, apart from grants administered under the Truman-Hobbs Act, are exclusively in the form of personnel required to administer the program. Military and civilian man years needed for fiscal year 1980 in both headquarters and field positions are given in table 2.

TABLE 2.—PERSONNEL ASSIGNED TO THE BRIDGE ADMINISTRATION PROGRAM IN FISCAL YEAR 1980 [1]

	Military	Civilian	Total
Headquarters	1	23	24
Field	5	53	58
Total	6	76	82

[1] U.S. Coast Guard. Bridge Administration (quarterly report). Sept. 30, 1981.

Total costs for the program, including administration of the grants but not the grants themselves, amount to about $5 million annually. In addition, expenditures under grants for bridge alteration, funded by separate appropriations under the Truman-Hobbs Act, are estimated at $15,850,000 for fiscal year 1981; while $17,500,000 has been requested for these grants in fiscal year 1982. Table 3 shows the bridges for which these funds are requested, with previous and anticipated funding and estimated total U.S. grant costs.

TABLE 3.—BRIDGE ALTERATION PROJECTS FOR WHICH REQUESTED FISCAL YEAR 1982 FUNDS WOULD BE EXPENDED [1]

[In thousands of dollars]

Bridge/owner	Fiscal year 1982 request	Funded to date	Future funding	Total estimated U.S. cost
1. Illinois River, Pearl, Ill. (Illinois Central Gulf RR.)	1,200	17,300	.....	18,500
2. Gulf Intracoastal Waterway, Houma, La. (Southern Pacific RR.)	600	9,200	.....	9,800
3. Three Mile Creek, Mobile, Ala. (Alabama State Docks Department RR. Bridge)	4,500	1,100	400	6,000
4. Pt. Pleasant Canal, Pt. Pleasant, N.J. (New Jersey DOT Highway 88)	2,900	500	7,700	11,100
5. Illinois River, Peoria, Ill. (Peoria & Pekin Union RR.)	8,300	.....	16,400	24,700
Total	17,500	28,100	24,500	70,100

[1] Private communication. Bridge Administration Division. October 6, 1981.

Program Standard for the Bridge Administration Program

Based on empirical information and the experienced judgment of the staff of the Bridge Administration Division of the Coast Guard's Office of Navigation, the program standard was prepared

for the latest operating program plan.[9] This standard, stated in terms of seven goals and milestones by which it is hoped to achieve these goals, is reproduced in table 4.

TABLE 4.—PROGRAM STANDARD FOR THE COAST GUARD BRIDGE ADMINISTRATION PROGRAM [1]

Goals	Milestones
1. Determine jurisdiction and review permit applications for all bridges constructed across navigable waters of the United States.[2]	Provide timely actions on all requests for bridge permits.[3]
2. Assess the environmental impacts of all actions and prepare appropriate environmental documentation.[2]	All Federal actions.
3. Insure that bridges do not unreasonably obstruct navigation [2]	Timely investigation of all significant complaints and bridges with high accident rates.[3]
4. Bridge alteration pursuant to the provisions of the Truman-Hobbs Act [4]	2 to 5 bridges per year.
5. Insure drawbridge regulations are appropriate and complied with [2]	Timely investigations of all complaints and requests for regulations.[3]
6. Inspect bridges which have significant navigation	Every 2 years.
7. Conduct transportation studies and/or research	As required.

[1] Adapted from Coast Guard Bridge Administration operating program plan: fiscal years 1983–92.
[2] Criteria are mandated by law.
[3] Time required for action is governed by decisions of Congress with regard to carrying out the applicable law.
[4] Criteria are governed by congressional appropriations.

There have been no challenges to the program standard. Within the Coast Guard a study completed in 1980, which addressed manpower requirements of all the Coast Guard programs, noted that methodologies for deriving resource requirements to achieve program performance levels "were found to be sketchy," as was the analysis section of the OPP.[10] It was noted in the study that the data base for determining resources used was based on a District survey done about 1976, and it was not clear that this information is updated annually. The data base was found to be neither accurate nor complete and was current only in the sense that the staff was aware of changes or variations in the time necessary to accomplish various tasks. It was on existing and past workload data that level A (program standard) projections were made.[11]

The staff of the Bridge Administration Division, Office of Navigation, recognizes that none of the milestones in table 4 are fully met. Milestones associated with goals 1, 2, 3, and 5 are partially being accomplished, and under goal 4, one to two bridges are being altered per year. Milestones under goals 6 and 7 are not being accomplished currently.[12]

According to its recent operating program plan for the Bridge Administration program, the Coast Guard's stated manpower needs for meeting this program standard (level A), along with required manpower resources increases above current level (level C), are given in table 5.

[9] U.S. Coast Guard. "Bridge Administration Operating Program Plan: Fiscal years 1983–92" p. 13.
[10] USCG. U.S. Coast Guard military personnel requirements. Pp. VII–1 and VII–2.
[11] Ibid., p. VII–3.
[12] Private communication. Oct. 6, 1981.

TABLE 5.—ANNUAL RESOURCE REQUIREMENTS TO MEET PROGRAM STANDARD AND INCREASES FROM CURRENT LEVEL FOR THE COAST GUARD'S BRIDGE ADMINISTRATION PROGRAM [1]

Goals	Milestones	Man hours	
		Annual resource requirements for level A	Annual resource change from level C to level A
1. Determine jurisdiction and review permit applications.	All requests for permit applications	45,200	+7,200
2. Assess environmental impacts:			
Coast Guard Lead Agency	All Federal actions	44,800	+4,800
Other lead agency	do	10,400	+2,400
3. Obstructive bridge investigations	All significant complaints and bridges with high accident rates.	15,275	+6,700
4. Alteration of bridge under Truman-Hobbs	4 to 5 bridges per year	11,700	+5,200
5. Drawbridge Regulations	All requests for regulations and complaints	33,000	+6,000
6. Inspect bridges which have significant navigation.	Every 2 years (4,500 bridges per year)	4,500	+900
7. Conduct trasnportation studies and/or research.	As required	+450	

[1] Adapted from Coast Guard Bridge Administration operating program plan: Fiscal year 1983–92.

Reduction of the Bridge Administration Program or Possible Transfer of Functions

There are no known serious proposals to reduce the scope of the Bridge Administration program. The program is relatively unpopular within the Coast Guard, however, where on a number of occasions opinions of Coast Guard officials have been stated that the program should be administered by the Army Corps of Engineers, from which it was transferred in 1967. This sentiment was expressed recently, for example, by Vice Adm. Robert H. Scarborough, Vice Commandant of the Coast Guard, in congressional appropriations hearings.[13] There have also been suggestions that the program might be relocated in other agencies within the DOT, such as the Federal Highway Administration.

H.R. 3411, introduced in the 97th Congress on May 4, 1981, by Representative Arlan Stangeland, would, among other things, transfer to the Secretary of the Army the responsibilities for administering the bridge program. In particular, the bill proposes to transfer, and vest in, the Secretary of the Army all functions, powers, and duties of the Secretary of Transportation and other officers of the DOT under laws and provisions of law relating to: First, drawbridge operation; second, obstructive bridges; and third, the locations and clearances of bridges and causeways in the navigable waters of the United States.[14] The bill was referred jointly to the House Committees on Merchant Marine and Fisheries and on Public Works and Transportation. There has been no further congressional action.

[13] U.S. Congress. House of Representatives. Committee on Appropriations. Subcommittee on the Department of Transportation and Related Agencies Appropriations. Hearings. Department of Transportation. Coast Guard. February 24, 1981. Washington, U.S. Government Printing Office, 1981. p. 802.

[14] H.R. 3411 introduced May 4, 1981, section 1(a) (2), (3), and (5).

While there could be some advantages to transferring this program to the Army Corps of Engineers, since the corps has other responsibilities for maintenance of harbors and waterways, it does not appear likely that such a transfer would occur in the foreseeable future. Since there would be little savings realized, inasmuch as the program would likely continue under the corps or other Department of Transportation agency at about its current level, there would be little or no advantage in making the change for budgetary reasons alone.

SHORT-RANGE AIDS TO NAVIGATION PROGRAM*

Background and Program Description

Aids to navigation are devices external to a vessel, providing visual, audible, or radar signals, which are intended to warn, guide, and enable mariners to determine position and a safe course. Aids to navigation, in general, supplement other information available to the mariner and are intended to reduce uncertainties of navigation. Installed aids provide observable signals which, in conjunction with charts, rules of the road, and waterway regulations, enable marine commerce to use the marine environment more safely and efficiently.[1]

The objective of the Coast Guard's Short Range Aids to Navigation (SRA) program is: "To develop, establish, maintain, and operate audible, visible, and radar aids to navigation to promote safety on or adjacent to the navigable waters of the United States and the waters above the continental shelf and to serve the needs of the Armed Forces and the commerce of the United States."[2]

Subobjectives and associated goals of the program are stated below:[3]

—To establish and improve Federal aids to navigation for commerce and to protect life and property.

To promote efficient commerce.

To protect the lives and property of participants and spectators of marine parades and regattas which are regulated by the Coast Guard.

To prevent vessel rammings of pierheads belonging to the United States on northern and northwestern lakes.

To improve the effectiveness of aids to navigation.

To provide primary input to national and international navigation policy.

To correct failures in aids to navigation.

—To establish aids to navigation for the Armed Forces and other Federal agencies.

To meet the requirements of the Armed Forces.

To meet the requirements of other Federal agencies.

—To administer the short range aids to navigation program and to provide cost effective maintenance of installed Federal aids to navigation.

To provide efficient operation of aids to navigation.

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* Prepared by Robert E. Morrison, Specialist in Marine Science, Science Policy Reserch Division.

[1] U.S. Department of Transportation. Coast Guard. "Short Range Aids to Navigation Program Plan: fiscal year 1983-92." Approved June 16, 1980. p. IV-2.

[2] Ibid., p. I-1.

[3] Ibid., pp. IV-1 to IV-15.

To reduce Coast Guard liability in claims arising from aids-to-navigation activities.

—To administer the private aids to navigation program and regulation by State governments of marine aids to navigation.

To promote compatibility among systems of aids to navigation provided by non-Federal sources.

To insure that non-Federal aids to navigation are operated and maintained in compliance with regulations.

—To maintain the personnel and operating facilities required for all aids-to-navigation activities.

To maintain adequate aids-to-navigation vessels.

To maintain adequate bases and other aids-to-navigation shore facilities.

To insure that acceptable staffing levels of trained and qualified personnel are maintained at all units.

There are nearly 90,000 short-range aids to navigation in use in U.S. navigable waters; almost 47,000 of these aids are under the total responsibility of the Coast Guard, while the Coast Guard also has a management responsibility for the 41,000 privately owned aids. Short-range aids include lighthouses, smaller lighted aids, unlighted daymarks, buoys, lighted and unlighted ranges (two aids which appear in line when a transmitting ship is in the channel), and sound signals. Some aids are also equipped with devices (racons) which return radar signals to vessels. Large, 40-foot diameter navigation buoys have replaced all but one of the former Coast Guard lightships. All short-range aids to navigation are serviced on some type of cycle, depending on type. Nonscheduled servicing and/or replacement is required for discrepancies—cases where aids are moved off station or become nonoperable because of ramming, vandalism, or other mishap.

The Federal program in short-range aids to navigation was begun with passage of an act on March 4, 1789, and the subsequent creation of a lighthouse establishment on August 7, 1789. Under that establishment the operation and maintenance of 12 lighthouses, formerly under jurisdiction of the several colonies, were assumed by the Federal Government. In the years following, this responsibility, with a number of reorganizations, was transferred between the Treasury and the Commerce Departments, and a number of improvements to lighthouses and other kinds of navigational aids were added. In 1939, the Lighthouse Service was transferred from the Department of Commerce to the Coast Guard, where full responsibility for short-range aids to navigation has remained since. By the mid-1960's all lighted buoys and lighthouses had been electified, replacing earlier devices which had used various fuels, including kerosene and acetylene.

The Coast Guard is also required to operate and maintain short range aids to navigation, on a nonreimbursible basis, for the Defense Department in U.S. waters. In the case of U.S. bases overseas the Coast Guard provides advice and technical assistance to the Defense Department on the installation and operation of such aids. There is also continuing interaction between the Coast Guard's short range aids to navigation program and other Federal agencies with specific missions in U.S. harbors and navigable waters: these include the Army Corps of Engineers (dredging operations), the

Maritime Administration (research and development), and the National Oceanic and Atmospheric Administration and the Navy (charting).

Bases for Responsibility for the Short-Range Aids to Navigation Program

The Coast Guard is authorized to establish, maintain, and operate aids to navigation, including visual, audio, and radar short-range navigation aids. As noted above some 47,000 short-range aids owned by the Federal Government are operated and maintained by the Coast Guard under authority granted by the following statutes:

14 U.S.C. 2 States that one of the Coast Guard's primary duties is the establishment, maintenance and operation of aids to navigation.

14 U.S.C. 81 Contains the basic authority for the Coast Guard to establish, maintain, and operate maritime and electronic aids to serve the needs of the armed forces or commerce in the United States, the waters of the continental shelf or other specified places.

14 U.S.C. 83 Makes it unlawful to establish, erect, or maintain aids to maritime navigation without Coast Guard permission.

14 U.S.C. 84 Makes it unlawful to change, obstruct, willfully damage or make fast to an aid to navigation.

14 U.S.C. 86 Generally authorizes type Coast Guard to mark sunken vessels or other obstructions when the owners thereof fail to properly do so.

14 U.S.C. 93 Generally authorizes the Coast Guard to establish, maintain and operate shore facilities, shops, depots, and yards for the manufacture and construction of aids, and to acquire or discontinue aids as well as move vessels and aids among Coast Guard districts.

14 U.S.C. 631 Authorizes the Secretary to delegate his powers to the Commandant, the Coast Guard, for its administration.

14 U.S.C. 643 Authorizes the Coast Guard to pay a reward for the apprehension of persons interfering with aids to navigation.

33 U.S.C. 408 Prohibits the taking possession of, use of, or injury to harbor or river improvements.

33 U.S.C. 411 Makes it a criminal offense to improperly use or to injure harbor improvements.

33 U.S.C. 412 Authorizes the imposition of civil penalties and other sanctions for masters and pilots of vessels willfully used to injure harbor improvements or to obstruct channels or waterways.

33 U.S.C. 472 Directs the Coast Guard to suitably mark anchorage grounds for vessels in waters of the United States.

33 U.S.C. 717-776 Contain various provisions relating to lighthouses amd members of the former lighthouse service.

43 U.S.C. 1333 Authorizes the Coast Guard to promulgate and enforce regulations with respect to lights and other warning devices on fixed structures and artificial islands on the

Outer Continental Shelf and to mark such fixed structures and artificial islands when the owner fails to suitably do so.

The Coast Guard is also authorized to permit the establishment of private aids to navigation on fixed or floating structures in or over the waters of the United States and, in some cases, the waters of the continental shelf or the high seas. The statutes under which the Coast Guard licenses and overseas such private aids are the following:

14 U.S.C. 83 Requires Coast Guard approval of any aid to navigation established by any person, public body or other instrumentality.

14 U.S.C. 85 Generally authorizes the Coast Guard to regulate lights and other signals on fixed and floating structures on and over waters of the United States and on the high seas for structures owned or operated by persons subject to the jurisdiction of the United States.

14 U.S.C. 86 Generally authorizes the Coast Guard to mark sunken vessels and other obstructions when the owners thereof fail to properly do so.

14 U.S.C. 631 Authorizes the Secretary to delegate his powers to the Commandant, Coast Guard, for its administration.

33 U.S.C. 409 Generally requires the owner of a sunken craft to mark it pending its removal.

33 U.S.C. 494 Requires the owner or operator of a bridge over navigable waters of the United States to maintain lights and other signals prescribed by the Coast Guard.

33 U.S.C. 1509 Generally authorizes the regulation and enforcement of warning devices on deepwater ports and authorizes the marking of such ports when the licensee fails to appropriately do so.

43 U.S.C. 1333 Authorizes the Coast Guard to promulgate and enforce regulations with respect to lights and other warning devices on fixed structures and artificial islands on the Outer Continental Shelf and to mark such fixed structures and artificial islands when the owner fails to suitably do so.

The regulations by which the Coast Guard manages both U.S. owned and private aids to navigation are contained in the Code of Federal Regulations, 33 CFR 60 through 76 (subchapter C). According to the Short Range Aids to Navigation Division of the Coast Guard's Office of Navigation, aids to navigation regulations are currently being rewritten by the Coast Guard.[4]

Resource Requirements for the Short-Range Aids to Navigation Program

It has been estimated that the short range aids to navigation program will account for about 16 percent of the Coast Guard's budget in fiscal year 1982. According to the Office of Navigation, Short Range Aids to Navigation Division, costs for this for fiscal years 1980 and 1981 and projected costs for fiscal year 1982 are as follows: [5]

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[4] Private communication. Oct. 6, 1981.
[5] Ibid.

Fiscal year:	*Millions*
1980	$179
1981	199
1982	225

The total manpower required (both direct and support) for this program is estimated at about 6,300 man years over fiscal years 1980 through 1982. At the start of fiscal year 1981 there were 66 aids-to-navigation teams, each consisting of from 4 to 20 people, and 11 aids-to-navigation facilities, comprised of extra men attached to ships for the purpose of servicing aids to navigation. There are 22 multimission bases, which include maintenance capabilities for aids to navigation, and three depots, which are smaller than bases with lower capabilities, serving aids to navigation only. Facilities also include 52 manned and 337 unmanned lighthouses.[6]

In recent years the number of short-range aids to navigation has grown at a rate of about 3 percent per year, nearly keeping up with the growth rate in recreational boating of about 5 percent per year. Table 1 shows the total numbers of various categories of Coast Guard and private short-range aids, by Coast Guard district, as well as totals for each type for the entire United States, as of March 31, 1981.

The various classes of Coast Guard vessels which are employed in servicing short-range aids to navigation, along with a brief description and the number of each, are listed in table 2. In addition to the tenders listed in the table, the Coast Guard also operates about 125 aids-to-navigation boats of various sizes, ranging from 21 to 65 feet in length, which are used by the various aids-to-navigation teams.[7]

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[6] Ibid.
[7] Ibid.

Table 1. Short-range aids to navigation of various types operated by the Coast Guard and private aids, by Coast Guard District and totals for the United States, as of March 31, 1981. a/

	DISTRICT	1	2	3	5	7	8	9	11	12	13	14	17	TOTAL
LIGHTS	MANNED	25	0	4	3	5	1	4	0	0	2	0	1	47
	UNMANNED	238	2357	688	1808	1902	1905	637	220	956	1141	168	573	12108
	TOTAL	263	2357	692	1811	1907	1906	641	220	956	1143	168	573	12155
DAYBEACONS		214	1263	270	2125	3351	2012	116	21	141	255	125	180	10073
LIGHTSHIPS		1	0	0	0	0	0	0	0	0	0	0	0	1
BUOYS	LIGHTED	991	10	796	572	508	910	608	119	110	270	69	187	4065
	UNLIGHTED	2486	8799	2115	1043	566	2348	1649	693	89	309	173	223	20488
	LNB b/	2	0	2	0	0	1	0	0	3	1	0	0	9
	TOTAL	2929	8809	2863	1615	1074	2759	2252	812	202	580	237	410	24562
TOTAL FEDERAL AIDS		3407	12429	3825	5551	6332	6677	3009	1053	777	1978	550	1163	46791

RACONS c/		1	0	2	7	0	3	4	0	1	2	0	11	31
SOUNDS	STRUCTURES	89	0	54	42	2	23	87	32	39	41	0	5	434
	BUOYS	393	0	233	137	142	95	88	87	75	135	2	74	1382
	TOTAL d/	482	0	287	179	144	118	175	59	114	176	2	81	1816

TOTAL PRIVATE AIDS		1389	3223	5583	1529	4792	21460	1754	477	259	459	123	217	41210

a/ Data obtained from the Coast Guard Office of Navigation, Short Range Aids to Navigation Division.

b/ Large Navigational Buoys.

c/ Radar Beacons. These are mounted on buoys or other structures listed in upper portion of table.

d/ Sound signals are mounted on buoys or other structures listed in the upper portion of the table.

TABLE 2.—*Coast Guard vessels employed in servicing short-range aids to navigation* [1]

Vessel class and description:	*Number*
WLB—Seagoing buoy tenders (180 feet)	28
WLM—Coastal buoy tenders (133, 157, and 175 feet)	15
WLIC—Construction tenders (various sizes up to 160 feet)	18
WLI—Inland tenders	6
WLR—River tenders	18

[1] Data obtained from Coast Guard Office of Navigation, Short-Range Aids to Navigation Division, October 1981.

PROGRAM STANDARD FOR THE SHORT-RANGE AIDS TO NAVIGATION PROGRAM

ESTABLISHMENT OF THE PROGRAM STANDARD

The program standard for the short-range aids to navigation program was developed by the Short Range Aids to Navigation Division of the Coast Guard's Office of Navigation. The standard, which appears in the operating program plan, is based on a number of current and future operational requirements, repair and maintenance functions, and managing and equipping of resources that are necessary to perform these functions.[8] The standard is given in table 3 in terms of what would be desirable levels of performance in meeting a series of milestones that are associated with program goals that were stated earlier.

DISCUSSION OF THE PROGRAM STANDARD

There have been no serious challenges to the program standard developed by the Coast Guard for the short range aids to navigation program. A recent study by the Coast Guard for the DOT and the Office of Management and Budget, commenting on the similar previous program plan for fiscal years 1981–91, concluded that: "The subobjectives, goals, and milestones appear to be logical groupings of those functions that are performed under the umbrella of this program."[9] It was noted in the study that there were no quantifications of output tied to the goals and milestones; however, it was recognized that output quantification is admittedly difficult for administrative and management goals. It was also understood that maintenance goals were spelled out in various operating instructions of the program, though they were not repeated in the operating program plan.[10]

TABLE 3.—*Program standard for the short-range aids to navigation program, required to meet milestones associated with program goals* [1]

Goal and milestones	*Standard*
To promote efficient commerce:	
Mark waterways and charted obstructions to navigation as necessary for efficient commerce.	95 percent of commercial waterways marked; 95 percent of charted obstructions marked.

[8] U.S. Coast Guard. "Short Range Aids to Navigation Program Plan: fiscal year 1983-92."
[9] U.S. Coast Guard. U.S. Coast Guard military personnel requirements. (Report to the Department of Transportation and the Office of Management and Budget.) October 1980, p. VII-48.
[10] Ibid., p. VII-49.

TABLE 3.—*Program standard for the short-range aids to navigation program, required to meet milestones associated with program goals*[1]—Continued

Goal and milestones	*Standard*
Locate and mark navigable channels in the western rivers of the United States.	100 percent of channels marked bimonthly.
Locate and mark, as appropriate, uncharted wrecks and obstructions to navigation.	Locate all uncharted wrecks and obstructions within 48 hours of notification and mark as appropriate.
Establish landfall and offshore approach signals.	100 percent of requirements for landfall and offshore signals.
Support VTS[2] and TSS[3]	Establish VTS and TSS where required within timeframe.
To protect the lives and property of participants and spectators of marine parades and regattas which are regulated by the Coast Guard: Establish temporary aids to navigation for marine parades and regattas.	100 aids established per year.
To prevent vessel rammings of pierheads belonging to the United States on northern and northwestern lakes: Mark pierheads belonging to the United States.	218 pierheads marked annually.
To improve the effectiveness of aids to navigation:	
Publish a light list	1 light list annually.
Promulgate changes to aids to navigation in the local notices to mariners.	11 local notices to mariners weekly.
Broadcast channel reports in the 2nd Coast Guard District.	1 channel report biweekly.
Broadcast safety notices to report failures in aids to navigation that may affect safety and other potential hazards to navigation.	100 percent of reports broadcast within 24 hours of notification.
Improve the accuracy of aids to navigation positions.	Survey the positions of 10 percent of all fixed aids to navigation annually.
Increase the availability of aids to navigation signals.	
(a) Use fast water buoys in selected open rivers..	100 percent of CCGD2 unlighted aids on station in open rivers are fast water buoys.
(b) use ice resistant aids in areas subject to ice cover..	
To correct failures in aids to navigation:	
Remove aids to navigation that are hazards to navigation.	90 percent hazards removed within 24 hours.
Correct misleading signals in aids to navigation.	90 percent misleading signals corrected within 48 hours.
Restore aids to navigation of reduced quality.	90 percent of signals of reduced quality restored within 72 hours.
To meet the requirements of the Armed Forces:	
Mark anchorage areas	637 aids established per year.
Mark danger, restricted and prohibited areas.	
Establish aids to navigation to support the requirements of naval or other military units.	
To meet the requirements of other Federal agencies:	
Meet requirements of other Federal agencies.	133 aids established per year.
Mark Canadian/United States boundary in Great Lakes.	8 aids established per year.

TABLE 3.—*Program standard for the short-range aids to navigation program, required to meet milestones associated with program goals*[1]—Continued

Goal and milestones	*Standard*
To provide efficient operation of aids to navigation.	
Renovate buoys	4,022 buoys annually.
Audit buoy signals and positions	13,350 buoys serviced annually.
Overhaul and inspect buoy mooring systems.	6,675 buoys serviced annually.
Recharge powered buoys	3,947 buoys serviced within rated battery discharge time.
Audit and maintain beacon signal characteristics.	17,707 beacons serviced annually.
Recharge powered beacons	9,081 beacons serviced within their rated battery discharge times.
Audit and maintain signals of major aids.	161 aids serviced annually.
Provide logistics support to WLV's[4] and light stations.	As required.
Refuel lighthouses and LNBs[5]	As required.
To reduce Coast Guard liability in claims arising from aids-to-navigation activities: Verify the operation of aids to navigation in the vicinity of a marine casualty.	Aids checked after all casualties within 24 hours.
To promote compatibility among systems of aids to navigation provided by non-Federal sources:	
Define requirements for private aids to navigation.	Annual review.
Act on requests for private aids to navigation.	Process 1,485 applications annually.
Define the uniform State waterway marking system.	Annual review.
To insure that non-Federal aids to navigation are operated and maintained in compliance with regulations:	
Conduct inspections of class I and class II private aids.[6].	100 percent of class I and class II private aids inspected annually.
Conduct inspections of class III private aids.[6].	33 percent of class III private aids inspected annually.
To maintain adequate aids-to-navigation vessels:	
Provide capital improvements to existing aids to navigation vessels.	Renovate 2 WLB's[7] annually through fiscal year 1987.
Replace the aids to navigation servicing capability that is lost when a vessel reaches the end of its nominal service life.	Replace 17 TANB's annually; Replace 3 WLR's by fiscal year 1985; Replace 33 BY/BUSL's by fiscal year 1986.[8]
To maintain adequate bases and other aids-to-navigation shore facilities: Provide capital improvements to existing bases and other shore facilities.	Complete all base development plans in 7 years.

[1] Information obtained from the Coast Guard short-range aids to navigation program plan: fiscal years 1983-92, p. V-1 through V-3.

[2] Vessel traffic services.

[3] Traffic separation schemes.

[4] Light vessels.

[5] Large navigation buoys.

[6] Class I—private aids on marine structures or other works which the owners are legally obligated to establish, maintain, and operate as prescribed by the Coast Guard.

Class II—private aids, exclusive of class I, located in waters used by general navigation.

Class III—private aids, exclusive of class I, located in waters not ordinarily used by general navigation.

[7] WLB: Class of seagoing buoy tender.

[8] TANB: Trailable aids to navigation boat; WLR: Class of river tenders; BU/BUSL: Buoy boats.

A GAO audit report, prepared in 1979, on the Coast Guard's marine transportation safety responsibilities, found alleged shortcomings in the management of the short range aids to navigation program.[11] Specific allegations in that report were that: First, discrepancies in aids were not corrected in a timely manner, second, sunken wrecks were not adequately marked, third, buoy tenders and construction tenders were not used effectively, fourth, aids to navigation teams ought to be used more extensively, and fifth, there was need for better management of personnel and spare parts in the aids-to-navigation mission. Recommendations were made to the Coast Guard for improving its response to aid discrepancies:

Establish performance standards based on sound data rather than intuitive judgment;

Make greater use of specially trained and equipped repair teams;

Change personnel practices, especially the policy of transferring staff every 2 years;

Maintain an adequate inventory of spare aids and parts by reducing aid losses caused by adverse weather; and

Reassesses workload distribution for buoy and construction tenders, giving consideration to transit times and age of tenders.[12]

The GAO report also recommended actions the Coast Guard could take to improve its management of the aids-to-navigation program;

Exercise discretionary authority to mark sunken vessels when the owners do not take such action, if possible, to assure removal of the vessels by the owners or by the Army Corps of Engineers; and

Establish procedures for consulting and considering mariners' views on aids to navigation and vessel traffic management systems.[13]

In response to the GAO study, the DOT rejected most of its conclusions. It was noted that, "In the allocation of Coast Guard resources, relatively low priority is given sometimes to nonurgent, incremental improvements to aids to navigation, resulting in delay in the funding of some projects. This delay is the result of deliberate management decisions and is not attributable to inefficient administrative procedures. It is illogical to infer that delay causes a hazard or impediment to commerce simply because the improvements are intended to promote the safety or facilitation of marine commerce." [14]

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[11] Comptroller General of the United States. "Coast Guard Action Needed to Promote Safer Marine Transportation." Report to the Congress. CED-79-37. Washington, D.C., U.S. General Accounting Office, May 21, 1979, 60 pages.

[12] Ibid., pp. i-ii.

[13] Ibid., pp. i-iii.

[14] Ibid., pp. 57-58.

The DOT reply continued, "The Coast Guard's alleged inability to meet its own criteria for correcting discrepancies and inadequancy in the maintenance of aids to navigation appear to derive primarily from a preception of the Coast Guard's failure to correct discrepancies within self-imposed time limits. * * * (A) series of misconceptions * * * include an exaggerated view of the frequency with which this failure occurs, a lack of general understanding of Coast Guard response policy and the actions that may constitute an acceptable response, the factors which affect the urgency with which a discrepancy must be corrected or compensated for, and the considerations pertinent to the management of servicing facilities, personnel, and spare equipment." The Department conceded, however, that "the Coast Guard has committed an administrative oversight in its failure to modify its policy when experience has shown that the response to discrepancies requires consideration of too many factors to permit the expression of realistic guidance in the form of specific time limits." [15]

The reply also stated that: "The Department rejects the unsubstantiated allegation that the Coast Guard often has been sued successfully over discrepancies in aids to navigation. The Department regrets the inaccurate representation by GAO of data supplied in writing by the Coast Guard.[16]

DOT also replied that:

> With respect to aids to navigation, the Department does not concur in the recommendations. Actions recommended concerning Coast Guard procedures for establishing and modifying aids to navigation are viewed as unnecessary. The perception of the needs for the action recommended is considered erroneous. The Department does recognize, within the scope of these recommendations, two specific actions by the Coast Guard which are appropriate. These are the study related to future replacement of buoy tenders and the consideration of changes to personnel rotation policy. Both of these actions have been undertaken by the Coast Guard * * *.
>
> The recommendation concerning sunken vessels is inappropriate. The discretionary authority of the Secretary with respect to marking is clear in 14 U.S.C. 86. Removal is a duty of the owner, or may come under the authority of the Corps of Engineers, depending on the factual circumstances.[17]

COAST GUARD NEEDS TO MEET THE PROGRAM STANDARD

Resource requirements to meet current (level C) and program standard (level A) performance levels were determined by the Coast Guard for the short range aids to navigation program in terms of cutter and boat hours, aircraft hours, man-hours, and additional costs not included in these resources. Level C man-hours were computed from estimates of the fraction of man-years spent by Coast Guard district offices, headquarters, and units in each of the functions associated with the SRA program. These man-hours allocated to the program at level C are shown in table 4. Changes in the program estimated to meet requirements under level A will result in a decrease of 16,648 man-hours by fiscal year 1992, due primarily to an estimated 50-percent decrease in manpower needs for the Standardized Aids to Navigational Data System (SANDS) and the aids to navigation positioning project.[18]

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[15] Ibid., pp. 58.
[16] Ibid.
[17] Ibid., pp. 59–60.
[18] U.S. Coast Guard. "Short Range Aids to Navigation Program Plan: Fiscal year 1983–92," p. IV–20.

Cutter and boat hour requirements are categorized under three general classes:

(a) Transit time—the movement of personnel, equipment, and materials between aids and resupply locations;

(b) Onsite time—the provision of a work platform for servicing at the aid location; and

(c) Nonunderway employment—loading time and time spent in port awaiting weather while committed to an SRA mission.[19]

TABLE 4.—*Current (level C) manpower requirements for the short-range aids to navigation program* [1]

Function:	*Man-hours*
District offices:	
1. Evaluation of Aid Systems	10,173
2. Aid Project Management	15,630
3. Unit Support and Supervision	26,432
4. Marine Information	64,002
5. Private Aids	15,466
6. Liaison with other agencies	14,896
7. Management Information	26,470
8. Training	19,141
9. Financial Plan	16,403
10. Inventory Control	7,688
Headquarters:	
11. Design	13,504
12. Maintenance	18,568
13. Management	20,400
Units:	
14. Maintenance	3,026,959
Total	3,295,738

[1] Data from the "Short Range Aids to Navigation Program Plan: Fiscal year 1983-92."

The three kinds of activities in which cutters and aids-to-navigation boats are involved are the establishment or disestablishment of aids, maintenance of aids, and aid discrepancy response. Fiscal year 1979 operations provided the data on cutter and boat hours needed to achieve level C—106,516 cutter hours and 75,096 boat hours. It has been assumed that cutter and boat employment hours for fiscal year 1979 are optimal; however, there is a difference between levels C and A in the allocation of vessel time expended for onsite maintenance of aids and for transit time, the former increasing and the latter decreasing under level A.[20]

Utilization of aircraft by the short range aids to navigation program is provided on a "time available" basis. The primary task for aircraft use is logistic support of manned structures, including the transportation of personnel. Other activities for which aircraft are used less frequently are:

(a) Routine and emergency servicing visits,

(b) Aids-to-navigation signal checks,

(c) Aids to navigation construction, and

(d) Search for missing or adrift floating aids.

There is no anticipated change between levels A and C for the total number of aircraft hours required—3,835 hours annually—although there would be a consolidation of those hours, after comple-

[19] Ibid., p. IV-21.
[20] Ibid., p. IV-23.

tion in fiscal year 1990 of the Lighthouse Automation and Modernization Program (LAMP), into full logistic support.[21]

There are additional expenses incurred in the SRA program beyond those associated with manpower and operation of vessels and aircraft. These annual costs arise from lamplighter services under contract (expected to be level through fiscal year 1992), a research study on the performance of systems of aids to navigation (to be completed in fiscal year 1985), LAMP automations and modernizations (to be completed in fiscal year 1990), battery replacements and recharges, installation of solar panels, renovation of seagoing buoy tenders under the Service Life Extension Project (SLEP) (to be completed in fiscal year 1987), acquisition of new aids-to-navigation boats (through fiscal year 1992), and improvements at shore facilities. The net change in costs for all of these activities would result in an increase of about $33 million per year by fiscal year 1992 for a move from level C to level A. Most of this increase would be associated with maintaining aids-to-navigation vessels and maintenance of shore facilities.[22]

A very serious concern of the Office of Navigation is the condition of the 28 seagoing buoy tenders (WLB's), all of which were built during World War II. These 180-foot vessels were designed by the Navy to have a very broad range of capabilities, perhaps too broad for optimum use in the SRA program. They have also responded to calls for search and rescue and marine environmental protection missions and to fisheries and drug interdiction patrols. A new kind of buoy tender is currently being contemplated, which would better serve the SRA program, but which could also meet other Coast Guard needs as determined by the current ongoing roles and missions study.[23]

Reduction of the Short-Range Aids to Navigation Program or Possible Transfer of Functions

There have not been any definite recommendations from industry or from Government officials supporting any reduction in the aids to navigation program, either in the number of aids maintained by the Coast Guard or in the level of services and management support involved in the program.

Representative Arlan Stangeland introduced a bill, H.R. 3411, in the 97th Congress on May 4, 1981, which would, among other things, transfer to the Secretary of the Army the short-range aids-to-navigation responsibilities now belonging to the Coast Guard. In particular, the bill proposes to transfer to, and vest in, the Secretary of the Army all functions, powers, and duties of the Secretary of Transportation and other offices and officers of the DOT under section 81 of title 14 of the United States Code, relating to the establishment, maintenance, and operation of aids to navigation.[24] The bill specifically excludes, however, the transfer of functions, powers, and duties related to the establishment, maintenance, and operation of long-range electronic aids to navigation, which would

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[21] Ibid., pp. IV-25 and IV-26.
[22] Ibid., p. IV-26.
[23] Private communication.
[24] H.R. 3411, introduced May 4, 1981. Section 1(a)(6).

remain with the Coast Guard.[25] The bill has been referred jointly to the House Committees on Merchant Marine and Fisheries and on Public Works and Transportation. There has been no further congressional action.

Some marine industries have recommended that responsibility for short-range aids to navigation be transferred, at least in some instances, from the Coast Guard to local port authorities or to local governments. There has not been any support for this recommendation, however, from local governments or authorities, who would appear to prefer continued responsibility with the Coast Guard.

There seems to be little chance that the short-range aids to navigation program, or even parts of the program, would be transferred elsewhere from the Coast Guard. There is generally considered to be a Federal role in aids to navigation in view of the strategic importance for maintaining the safety and security of navigation in U.S. harbors and waterways. This Federal interest is clearly seen in the case of the need of aids for military purposes. On the practical side, it does not seem likely that the 24-hour capability for discrepancy responses and maintenance services now available in the Coast Guard could be provided at the same cost by contractors or even by other Federal agencies or State and local governments. Contributing to the lower operating costs for the Coast Guard is the multimission mode by which many patrols are performed and under which vessels and personnel often serve more than one program while underway.

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[25] Ibid. Section 1(b)(1).

RADIONAVIGATION AIDS PROGRAM*

Background and Program Description

The objective of the Coast Guard's radionavigation aids (RA) program, according to the latest operating program plan, is:[1] "To establish, maintain, and operate systems of radio aids to navigation to provide a continuous, accurate, all-weather position determination capability in order to facilitate the safe and expeditious passage of marine and air traffic and meet the position-determination requirements of other non-marine segments of public and private sectors of the United States." This objective was formulated to be in conformance with the national navigation policy as described in the Federal radionavigation plan, published jointly by the DOD and DOT in July 1980.[2]

RADIONAVIGATION SYSTEMS

The three radionavigation systems operated by the Coast Guard are radiobeacons, loran, and Omega systems. Because of the Coast Guard's responsibility in providing radionavigation services to the nonmilitary sector, there is also interest in tracking the operation and development of two satellite navigation systems which are under the auspices of the DOD—TRANSIT and NAVSTAR—since both have value to the civil sector as well as the military. Each of these systems is described briefly below.

Radiobeacons are nondirectional radio transmitters with ranges from 10 to 175 miles, operating in the frequency band of 285 to 325 KHz. They are installed at lighthouses, on large buoys, and at other coastal locations. About 200 such aids are operated by the Coast Guard in the Pacific, Great Lakes, and Atlantic-Gulf areas. Radiobeacons are the primary low-cost, medium-accuracy radionavigation system for vessels that are equipped with minimal direction-finding equipment.[3]

Long Range Navigation (loran) systems, first introduced during World War II, operate by measuring time differences between arrivals of radio pulses which are radiated by a pair of synchronized transmitters, separated by a few hundred miles. In practice, information necessary to obtain a navigational "fix" can be obtained

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*Prepared by Robert E. Morrison, specialist in marine science, Science Policy Research Division.

[1] U.S. Dept. of Transportation. Coast Guard. "Radionavigation Aids Program Plan: Fiscal Year 1983-92." Approved July 31, 1980, p. I-2.

[2] U.S. Dept. of Defense and U.S. Dept. of Transportation. Federal radionavigation plan. DOD—No. 4650. 4-P, 1 and DOT-TSC-RSPA-80-16, 1. In 4 volumes (vol. I, radionavigation plans policy, 76 pages; vol. II, requirements, 40 pages; vol. III, radionavigation system characteristics, 36 pages; and vol. IV, radionavigation research, engineering, and development, 112 pages) Washington, D.C., July 1980.

[3] Information based on discussions with personnel in the Coast Guard's Office of Navigation, Radionavigation Division.

from three loran stations. Early stations were designated loran-A, utilizing medium-frequency radio transmissions; however, the low-frequency loran-C system provides improved accuracy and extended coverage with fewer transmitting stations than loran-A, and loran-C provides service over land, not possible with the loran-A system. All loran-A service provided by the United States was terminated December 31, 1980.

Loran-C, which was adopted for the U.S. Coastal Confluence Zone (CCZ)[4] in 1974, operates at frequencies of 90 to 110 kHz and provides all-weather accuracy within ¼ of 1 nautical mile, with a range of 1,500 miles. Loran-C for the U.S. CCZ includes 8 domestic loran-C chains consisting of 23 U.S. stations, 2 Canadian stations, and 2 monitor stations. The Coast Guard operates, for the DOD, five loran-C chains overseas; some of the transmitting and monitoring stations in these chains are operated by the Coast Guard, while others are operated by the host country under bilateral agreements, funded by the United States. In addition, the U.S. Air Force mans two transmitting stations and Canada funds one monitor station. This service is available to all users, military and civilian, of all nations; however, use of loran-C by the DOD will be reduced as NAVSTAR becomes operational. Loran-C covers not only U.S. coastal areas and waterways but also about two-thirds of the land area of the coterminous States. Extension of coverage to all of the 48 coterminous States would require three to five midcontinent stations to be added.[5]

Omega is a phase-comparison system, operating at very low frequencies, 9 to 14 kHz, consisting of 8 transmitting stations and 50 monitoring stations throughout the world. All-weather coverage worldwide is provided with 2- to 4-nautical-mile accuracy. The Coast Guard operates two Omega transmitting stations (in North Dakota and Hawaii) and staffs the Omega Navigation System Operations Detail (ONSOD). The five other existing stations are operated by the host countries, with varying amounts of technical and logistic support from the Coast Guard. The remaining eighth station, to be completed in Australia, is expected to become operational during 1983. In addition to use by defense aircraft and ships, private and commercial ships and aircraft, including those of foreign countries, use or plan to use this system when traveling oceanic routes. Omega is limited in accuracy and cannot be used when close to a station; hence it does not meet the requirements for maritime navigation in U.S. coastal areas or for aircraft flying in U.S. terminal airspace.[6]

The U.S. Navy Navigation Satellite System [TRANSIT] is a satellite-based positioning system which provides submarines and both military and civil ships with accurate positioning. Defense use of

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[4] The Coastal Confluence Zone is defined as "the region extending from the harbor entrance to 50 nautical miles offshore or to the edge of the continental shelf (100 fathom curve), whichever is greater. The zone includes the waters contiguous to major land masses or island groups wherein transoceanic traffic patterns tend to converge in approaching destination areas, where interport traffic exists in patterns that are essentially parallel to coastlines, and within which ships of lesser range usually confine their operations. "U.S. Dept. of Transportation." Department of Transportation National Plan for Navigation." Washington, D.C. November 1977, p. B-12.

[5] Ibid.

[6] Ibid.

TRANSIT has been greatly exceeded by domestic and foreign commercial use. It is estimated that there are about 270 military TRANSIT users compared with approximately 4,000 sets in use by commercial ships.[7] The Department of Defense plans to continue to operate TRANSIT through 1992; however, phaseout of TRANSIT by the military will likely begin in 1986 when NAVSTAR is expected to be operational. In its role as the representative Federal agency for the civil maritime community in navigational planning, the Coastal Guard is the central point of contact for civil users of TRANSIT and works closely with the DOD and other Government agencies to improve the planning and coordination of all Federal radionavigation systems, including TRANSIT as well as NAVSTAR now under development.

The NAVSTAR global positioning system [GPS] is a navigational satellite system under development by the DOD, intended to provide highly accurate, continuous, worldwide positioning information for weapons delivery systems as well as a number of other missions. When fully developed in the latter half of the 1980's, the system will use 18 satellites and will provide 2 levels of positioning capability. The precise mode is expected to provide position accuracy of 16 meters or better and will be encrypted, while a coarse signal, without encryption, will be degraded to an accuracy of about 200 meters. The DOT is evaluating civil uses of the NAVSTAR GPS system. The Coast Guard is the central point of contact for potential civilian maritime users of NAVSTAR and has undertaken a research and development program to evaluate civil applications of NAVSTAR. Current national policy on civil access to NAVSTAR is set forth in the Federal radionavigation plan.[8]

HISTORICAL DEVELOPMENT OF COAST GUARD RADIONAVIGATION SERVICES

Navigation requirements of the U.S. Armed Forces were the stimulus for development of all radionavigation systems in use by the United States. Marine radiobeacons were developed during and after World War I, and now all vessels over 1,600 gross tons that are engaged in international trade are required, under the Safety of Life at Sea [SOLAS] Convention, to be equipped with a radio direction finder. Loran-A became operational during World War II and provided the most reliable long-range navigation system available within the state of the art then existing. The Coast Guard, operating as part of the Navy, became involved in loran operation during World War II; since the war the Coast Guard has continued this operation in its roles of providing navigation services to both the armed services and to maritime commerce. As noted earlier, the Coast Guard has not only operated loran stations for navigation in U.S. waters, but also has funded a number of foreign stations in support of U.S. military needs, pursuant to international agreements. It has also been stated that loran-A was phased out in December 1980 in favor of the loran-C system. Following a major study of the suitability of existing radionavigation systems, in 1974

[7] Ibid.
[8] DOD and DOT. "Federal Radionavigation Plan," pp. I-4 to I-6.

the DOT announced that the loran-C system would be upgraded and expanded to provide coverage for the entire U.S. Coastal Confluence Zone [CCZ] and the Great Lakes.

In 1967, the DOD tasked the Navy to implement Omega as a worldwide ocean navigation system. Anticipating use of Omega for civil maritime navigation on the high seas, the Secretary of the Navy and the Secretary of Transportation agreed that the Coast Guard would eventually assume U.S. responsibility for the system. The formal transfer of Omega, including facilities, operational responsibilities, and budgeting obligations beginning in fiscal year 1981, was authorized in a letter in 1979 to the Secretary of Transportation from the OMB.[9] All remaining Navy responsibility for Omega was transferred to the Coast Guard on October 1, 1980.

SUBOBJECTIVES AND GOALS OF THE RADIONAVIGATION PROGRAM

The objective stated earlier for the Coast Guard's radionavigation program calls for a continuous, all-weather position-fixing capability to "facilitate safe and expeditious passage of marine and air traffic" and also meet other needs. Radio aids to navigation cannot meet this objective for all cases for all users. Recognizing certain practical shortcomings of the overall objective, the following subobjectives and associated goals were developed to provide services in accordance with user needs in terms of activities and locations:[10]

—Provide radionavigation service to assure a capability for safe navigation in the ocean phase of navigation, worldwide, and for the coastal and harbor approach phases of navigation in U.S. coastal waters and the Great Lakes.

Operate Omega as primary Government-provided marine ocean navigation system.

Institute loran-C as the primary Government provided radionavigation system for U.S. coastal waters and the Great Lakes.

Provide loran-C service in the CCZ of the United States.

Provide coastal marine radiobeacon service.

Develop and maintain U.S. policy within international Omega community on matters relating to system management policy.

Measure and optimize Omega system performance to achieve accuracy and coverage standards.

Provide loran-C for Hawaii, Alaskan North Slope, and Puerto Rico and U.S. Virgin Islands.

Improve coastal marine radiobeacon service.

—To provide radionavigation service for marine navigation in harbors, restricted inland waterways, and selected rivers.

Establish relationship between physical radionavigation systems and human ability to navigate in restricted waterways.

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[9] Letter, dated Oct. 15, 1979, to Neil Goldschmidt, Secretary of Transportation, from R. O. Schlickeison, Associate Director for Economics and Government, Office of Management and Budget, Executive Office of the President.

[10] U.S. Coast Guard. "Radionavigation Aids Program Plan: Fiscal year 1983-92," pp. III-1 to III-3.

Develop full ability of loran-C for precision navigation in harbors, harbor entrance, and other stable restricted waterways.

Evaluate costs and benefits of electronic positioning systems for navigation of rivers.

—Optimize the usefulness of Government-provided radionavigation services to waterborne activity in support of national economic, scientific, defense, and social needs.

Maximize the usefulness of the coastal loran-C system to maritime transportation and other waterborne activity.

Observe the use of satellite navigation systems and monitor their management to insure adequate consideration of civil maritime needs.

Reduce resources required for operation of radionavigation aids.

—To provide radionavigation services for the DOD peculiar to warfare, and for other Government agencies to meet specialized needs.

Provide loran-C service which meets DOD requirements.

Provide loran-C services in support of aviation needs identified by FAA and other nonmarine applications as directed by the Secretary of Transportation.

BASES FOR RESPONSIBILITIES FOR THE RADIONAVIGATION PROGRAM

The DOD is the primary Federal agency with responsibility for providing aids-to-navigation services for the civil community and certain services for the military. As such it prepares and promulgates radionavigation plans to the civil sector of the United States. As part of his authority under the DOT Act. (Pub. L. 89-670), the Secretary of Transportation has the responsibility within the Department for navigational matters and for promulgation of radionavigation plans. Within the Department, the three elements with statutory responsibilities for aids to navigation are the Coast Guard, the Federal Aviation Agency, and the St. Lawrence Seaway Development Corporation.

The Coast Guard has statutory responsibility to define needs for, and to provide, electronic aids to navigation in accordance with the following statutory authorities:

14 U.S.C. 2 States that one of the Coast Guard's primary duties is the establishment, maintenance, and operation of aids to navigation.

14 U.S.C. 81 Contains the basic authority for the Coast Guard to establish, maintain, and operate maritime and electronic aids to serve the needs of the Armed Forces or commerce in the United States, the waters of the Continental Shelf, or other specified places.

14 U.S.C. 82 Requires the Coast Guard to cooperate with the Administrator of the Federal Aviation Administration when establishing air navigation aids.

14 U.S.C. 93 Generally authorizes the Coast Guard to collect, publish, and distribute information concerning its operations, including loran-C, and to conduct experiments and in-

vestigations with regard to its functions, including radio aids to navigation.

14 U.S.C. 141 Generally authorizes the Coast Guard to utilize its personnel and facilities to assist other Federal or State agencies on request.

14 U.S.C. 142 Authorizes the Coast Guard to exchange information with foreign governments as specified through the Secretary of State.

14 U.S.C. 149 Authorizes the President to detail personnel of the Coast Guard to assist foreign governments.

14 U.S.C. 643 Authorizes the Coast Guard to pay a reward for the apprehension of persons interfering with aids to navigation.

In addition to the responsibilities assigned to the Coast Guard under these authorities, a number of agreements between the Coast Guard and the DOD provide for specific radionavigation services, particularly with regard to loran and Omega. Authority for ultimate assumption of the Omega system by the Coast Guard from the Navy was contained in a letter noted earlier from OMB to the Secretary of Transportation in 1979.[11]

In April 1979, an interagency agreement between the DOT and DOD strengthened planning in radionavigation services. Within Transportation, a Navigation Council and supporting working groups address civil and joint civil/military navigation uses, including radionavigation interests of other civil governmental agencies such as the NASA, the Department of Commerce, and State and municipal agencies. The Defense Department Positioning/Navigation Executive Committee addresses navigation uses by the military services. The Federal radionavigation plan, to be revised annually, is intended to serve as the primary planning document for all common-user Federal radionavigation services.[12]

Resource Requirements for the Radionavigation Program

Annual requirements for funding and for military and civilian personnel for the Coast Guard's radionavigation program are given for fiscal years 1979 through 1982 (estimated) in table 1.

TABLE 1.—BUDGET AND MANPOWER DATA FOR THE RADIONAVIGATION PROGRAM.[1]

	Fiscal year—			
	1979	1980	1981	1982
Direct program dollars (millions)	48.9	55.1	61.5	69.5
Direct w/support dollars (millions)	62.0	69.9	78.0	88.1
Military personnel (man-years):				
Direct	1,347	1,362	1,366	1,379
Support	383	387	388	392
Total	1,730	1,749	1,754	1,771
Civilian personnel (man-years):				
Direct	158	158	143	141

[11] Letter of Oct. 15, 1979, from the Office of Management and Budget to the Secretary of Transportation.

[12] U.S. Department of Defense and U.S. Department of Transportation. "Federal Radionavigation Plan." July 1980, p. I-1

TABLE 1.—BUDGET AND MANPOWER DATA FOR THE RADIONAVIGATION PROGRAM.[1]—Continued

	Fiscal year—			
	1979	1980	1981	1982
Support	134	133	121	120
Total	292	291	264	261

[1] Data from Radionavigation Division, Office of Navigation, U.S. Coast Guard. Oct. 6, 1981.

In addition to the manpower and dollar requirements there are also minimal requirements for cutters, boats, and aircraft for servicing the radionavigation facilities. At current performance levels such requirements, on an annual basis, are 94 cutter days, 1,716 boat hours, and 1,977 aircraft hours. The facilities and stations operated by the Coast Guard for radiobeacons, loran, and Omega are discussed above under program description.[13]

Program Standard for the Radionavigation Aids Program

ESTABLISHMENT OF THE PROGRAM STANDARD

It was recognized in developing the program standard that, while the amount of effort needed to achieve a certain level of performance is a convenient measure of program effectiveness, the direct measurement of benefits is difficult. There was an attempt, in view of the subobjectives and goals listed earlier, to identify the required performance levels, in terms of benefits to be derived from resource expenditure, in order to achieve full or partial accomplishment of the subobjectives. Among the measures of performance and benefits considered in this analysis, signal performance parameters were selected to represent level of effort, and coverage area was selected to represent the benefits.[14]

In view of these, the quality of the service provided is represented by the quality of the signal; and changes in any of the following signal parameters will alter the effectiveness of the system:

Signal characteristics;
Accuracy;
Availability; and
Reliability.

The optimum signal performance standards for radiobeacons, Omega, and loran-C chains was considered to be the current performance standard.[15]

While the user of a radionavigation system may derive benefits from improvements in fix rate, system capacity, fix dimension, and reduction in system ambiguity, these parameters are essentially dependent upon the type of system and are independent of the way the system is constructed or arranged. Consequently, coverage area was considered to be the most practical measure of user benefits. Idealistically, "user-square miles" would be the parameter for measuring benefit, since it serves no purpose to cover an area

[13] Coast Guard. "Radionavigation Aids Program Plan: Fiscal year 1983-92," pp. V-3 through V-14.
[14] Ibid., p. V-1.
[15] Ibid.

where there are no users; accurate data were not available on the distribution of the user population, however. Consequently, square nautical miles had to be adopted as the linear, unweighted measure of user benefit.[16]

Table 2 presents the program standard for radionavigation services in terms of area coverage and the percent of time, calculated on a monthly basis, that such coverage should be available.

TABLE 2.—PROGRAM STANDARD FOR THE RADIONAVIGATION AIDS PROGRAM.[1]

Element	Coverage (Square (nautical miles)	Availability (percent)
1. Omega	([2])	95
2. Loran-C for civil use:		
a. Central Pacific chain	1,032,000	99.7
b. North Pacific chain	2,014,000	99.7
c. Gulf of Alaska chain	1,093,000	99.7
d. Canadian west coast chain	378,000	99.7
e. U.S. west coast	1,114,000	99.7
f. Southeast U.S. chain	1,044,000	99.7
g. Northeast U.S. chain	917,000	99.7
h. Great Lakes chain	593,000	99.7
i. RA requirements in Hawaii, Puerto Rico, Virgin Islands, and Alaskan North Slope	1,555,000	99.7
j. Mid-continent chain	1,100,000	99.7
3. Loran-C for DOD:		
a. Mediterranean Sea chain	1,063,000	99.7
b. Norwegian Sea chain	2,676,000	99.7
c. North Atlantic chain	2,408,000	99.7
d. Northwest Pacific chain	4,908,000	99.7
4. Radiobeacons	619,088	100

[1] From Coast Guard "Radionavigation Aids Program Plan: Fiscal year 1983–92," p. V–2.
[2] 90 percent of worldwide.

DISCUSSION OF THE PROGRAM STANDARD

According to the Radionavigation Division of the Coast Guard's Office of Navigation, there have been no challenges to the program standard.[17] There has been a very conscious attempt, in fact, to assure that the program standard in the radionavigation aids program agrees with the services to be provided by these Coast Guard operated systems as prescribed in the Federal radionavigation plan.[18] It should be noted that both the Coast Guard operating program plan and the Federal radionavigation plan were prepared and approved at about the same time and that both are currently under revision.

With regard to development of the radionavigation aids program standard in the operating program plan (OPP) previous to the current one, it was stated in a Coast Guard internal report, prepared for the DOT and the OMB, that:

> The OPP contains a description of the resources being utilized in five program areas: Loran-C, loran-A, Radiobeacons, Omega, and program liaison and management. Based on a level C of resource utilization, the program standard resource level is constructed by adding manhours, aircraft hours, and cutter days to complete

[16] Ibid.
[17] Private conversation.
[18] DOD and DOT. "Federal Radionavigation Plan." July 1980.

the tasks that the program considers necessary in order to obtain the optimum radio aids system.

A mathematical analysis of the marginal needs of the program is not conducted, but rather, a standard defined by number of square miles of coverage is evolved, relying on the judgments of the program manager and based on the amended NPN (National Plan for Navigation.) Fortunately, the judgments appear logical; however, in the OPP it is difficult to follow the association between the hypothetical program standard and the increase/decrease in resource needs established by the program manager.[19]

The Coast Guard report to DOT and OMB goes on to note constraints in the program:

The radionavigation aids program is a relatively complex program because of its broad interface with international conventions, the civil maritime community, DOD, the Department of State, and the growing non-maritime user group. Because of these involvements and the fact that the program manager acts as the principal U.S. partner in the radionavigation aids system in the international arena, the program's ability to optimize resources is limited to either adjusting manning levels at transmitting stations or modifying the frequency of performing logistic deployments.

The program manager's involvement with the development of the Federal Radionavigation Plan (mandated by recent law) has caused a recent growth in the program's staff resources because of both the complexity and volume of this task. Other non-military involvements in program activities on a worldwide basis and the program's unique performance standard also contribute to the complexity of achieving standard performance.[20]

The report continues, commenting on the program outputs:

Generally, the outputs of the program as received by the user are unknown because there are no internal measures of efficiency for the program standard, and the user group is not accurately defined. The value of the output also depends on the user equipment as well as the signal provided. Refinements in measured outputs can be made by adjusting the number of square miles of radio coverage or by conducting extensive user surveys to identify shifts in user groups. . . . Demand for program outputs is difficult to forecast. . . . Frequent and rapid changes in technology in the electronics field also impact on the program because they are not easily predictable, thus, causing program outputs or the coverage requirements to vary with changing user needs.[21]

In conclusion, the Coast Guard personnel requirements report discusses the reasonableness of the program standard:

The figures, both in terms of output and resource requirements, contained in the program standard are reasonable and related to the program's current environment. However, the analysis described in the OPP is focused on problems, which tend to restrict the development of resource requirements to a problem solving proposal rather than to the development of an optimum system to deliver a public service. The design of an optimum system may be beyond the expectations for an OPP and may more properly lie in the realm of the Federal Radionavigation Plan.[22]

The program standard given in table 2 states the program which has been considered optimum. Discussion with personnel of the Radionavigation Division of the Coast Guard's Office of Navigation revealed that this standard is currently nearly always met and that availability is often as high as 100 percent in those cases where 99.7 percent is set as the standard. It was also indicated that, not only were there no challenges to the program standard, but that it

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[19] U.S. Coast Guard. "U.S. Coast Guard Military Personnel Requirements." (Report to the Department of Transportation and the Office of Management and Budget.) October 1980, p. VII-33. The recent operating program plan (July 1980) follows nearly the same procedure, and observations quoted are likely to be relevant to the current OPP as well. (As noted before, loran-A was phased out and is not addressed in the current OPP.)

[20] Ibid., p. VII-36.

[21] Ibid.

[22] Ibid., p. VII-37.

was considered by others, particularly the DOD, to be "highly acceptable." [23]

COAST GUARD NEEDS TO MEET PROGRAM STANDARD

There are certain changes from the current performance level—level C—resource requirements which the Coast Guard has identified to reach and maintain performance at the optimum levels. Surprisingly, many of these changes are proposed decreases, while some are increases over current resource requirements. These resource changes—in terms of cutter days, boat hours, aircraft hours, man-hours, and dollars—are given in table 3 in accordance with each of the goals stated earlier under the four sub-objectives of the program. The program plan breaks down these requirements even further in accordance with the milestones associated with each of the goals; however, table 3 contains a summary of information from an extended table in the program plan.

In connection with the goal in table 3 for providing loran-C for Hawaii, the Alaskan North Slope, and the eastern Carribean Sea, studies are completed, underway, or about to be undertaken on extension of this system to each of these regions. Based on a study recently completed, the Commandant of the Coast Guard has recommended that loran-C not be expanded into the eastern Caribbean region. This recommendation was a conclusion in a Coast Guard-sponsored cost/benefit study that expansion into the eastern Caribbean is not cost effective and that neither the DOD nor the FAA has a requirement at this time for loran-C in the area. Numerous other reasons were given in support of this conclusion.[24] It will be noted from table 3 that extension of loran-C services into these three areas would contribute to significant increases in requirements for manpower and aircraft hours and moderate increases in costs and cutter hours. Modification of the requirement changes associated with this goal will depend on a final decision on extension of loran-C into the eastern Caribbean and on conclusions and decisions regarding extension of the system into the other two areas, that is, Hawaii and the North Slope of Alaska.

TABLE 3.—CHANGES IN RESOURCE REQUIREMENTS FROM CURRENT LEVEL TO OPTIMUM PROGRAM [1]

Goal	Annual resource change from level C				
	Cutter days	Boat hours	Aircraft hours	Man-hours	Dollars (thousands)
Operate Omega as primary Government-provided marine navigation system for the open ocean	0	0	0	−53,690	−550
Institute loran C. as the primary Government-provided radionavigation system for U.S. coastal waters and the Great Lakes	0	0	0	0	0
Provide coastal marine radiobeacon service	−25	−830	−711	−149,368	−1,500
Provide loran-C in the Coastal Confluence Zone of the United States	+120	0	+300	+20,020	+29,400
Develop and maintain U.S. policy within the international Omega community on matters relating to system management policy	0	0	0	−900	+50

[23] Private communication. Oct. 6, 1981.

[24] Letter from Adm. J. B. Hayes, Commandant of the Coast Guard, to the Secretary of Transportation, dated Mar. 11, 1981, on loran-C expansion in the Caribbean.

TABLE 3.—CHANGES IN RESOURCE REQUIREMENTS FROM CURRENT LEVEL TO OPTIMUM PROGRAM [1]—Continued

Goal	Annual resource change from level C				
	Cutter days	Boat hours	Aircraft hours	Man-hours	Dollars (thousands)
Measure and optimize Omega system performance to achieve accuracy and coverage standards	−20	0	−140	−30,220	−800
Provide loran-C for Hawaii, Alaskan North Slope, and Puerto Rico and U.S. Virgin Islands	+35	0	+1,236	+580,320	+6,600
Improve coastal marine radiobeacon service	−8	−85	−250	−875	+24,425
Establish relationship between physicial radionavigation systems and human ability to navigate in restricted waterways	0	0	0	+7,280	+250
Evaluate costs and benefits of electronic positioning systems for navigation of rivers	0	0	0	+455	0
Develop full ability of loran-C for precision navigation in harbor entrance, harbors, and other stable restricted waterways	0	+100	0	+7,280	+1,200
Maximize the usefulness of the coastal loran-C system to maritime transportation and other waterborne activity	0	+100	0	+10,920	+450
Promote the use of satellite navigation systems and monitor their management to insure adequate consideration of civil maritime needs	0	0	0	+2,730	+1,000
Reduce resources required for operation of radionavigation aids	0	0	0	−32,760	+600
Provide loran-C service which meets Defense Department requirements	0	0	+125	+16,380	+9,000
Provide loran-C services in support of aviation needs identified by the FAA and other nonmarine applications as directed by the Secretary of Transportation	0	0	0	0	0

[1] Data from Coast Guard radionavigation aids operating program plan: Fiscal year 1983–92.

Currently, there are about three different generations of loran transmitters, and there is also a variety of antennas in use. Part of a continuing need to upgrade this equipment is a new solid-state transmitter which has been developed and for which procurement has been contracted. Deployment of these transmitters and associated equipment is about one-fifth complete under this upgrading program, and there is a need for further procurements to finish those stations intended for improvement, since not all stations are to be upgraded. Depending upon location, costs for this equipment are $10 to $12 million per station. There is an operational savings associated with the new transmitters, whose capacity is now up to one megawatt, since this solid-state equipment has lower power consumption and is designed to be "fail soft." [25]

A recent study by the GAO, recognizing the potential for the NAVSTAR global positioning system (GPS) under development by the DOD, recommends that further development and modernization of loran-C by the DOT should be terminated since NAVSTAR GPS could replace loran-C by the early 1990's.[26]

Specifically the GAO study contains the following findings:

[25] Private communication. Division of Radionavigation, Office of Navigation, U.S. Coast Guard. Oct. 6, 1981.

[26] U.S. General Accounting Office "DOT Should Terminate Further LORAN-C Development and Modernization and Exploit the Potential of the NAVSTAR/Global Positioning System." Report to the Secretary of Transportation. MASAD-81-42. B-203651. Washington, D.C., Sept. 18, 1981, 15 pages.

The Coast Guard plans to make a recommendation in 1982 to the Secretary of Transportation which should clarify the future role of GPS versus loran-C, without adequately developing the technology necessary to ensure the availability of low cost GPS receivers that are essential to effect widespread acceptance of GPS by the civil marine community.

The Coast Guard plans to continue operating loran-C until at least the year 2000, at a cost of approximately $35 million a year currently, escalating to approximately $60 million a year by 1984, although the GPS is scheduled to provide coverage equivalent to loran-C as early as 1986; DOD plans to discontinue its use of loran-C in the early 1990's.

The Coast Guard plans to spend at least $25 million to replace certain existing loran-C transmitters without adequately demonstrating either the need for, or the cost effectiveness of, the replacement.[27]

Based on a GAO review, the report contends that the Coast Guard's plan to operate loran-C until at least the year 2000 is founded on questionable assumptions and that the Coast Guard should phase out civil use of loran-C by the early 1990's instead. Such phaseout by the early 1990's would be consistent with the Defense Department's plan to phase out its use of loran-C at about the same time. The report recommends that the Secretary of Transportation direct the Coast Guard to:

Discontinue developing new loran-C marine applications which GPS has the potential to satisfy and focus efforts and resources on developing and demonstrating low-cost GPS user equipment technology which is essential to civil acceptance and use of GPS.

Develop a tentative timetable to phase out loran-C by the early 1990's, and if DOT's preliminary decision in 1983 supports GPS, inform the public at that time of the tentative timetable so as to allow users to make informed decisions on replacement of current loran-C receivers.

Terminate its planned replacement of certain existing loran-C transmitters with new solid-state transmitters, unless the Coast Guard can validly demonstrate on a station-by-station basis that this upgrade will be cost effective by the early 1990's.[28]

The GAO study recognized that these recommendations were dependent on the deployment of GPS and provision of appropriate coverage by 1986. If GPS coverage were not available until after 1986, the Coast Guard could revise its tentative schedule for phaseout of loran-C to allow users a sufficient transition period. Ample time would remain, it was argued, for the Coast Guard to assess the need for, and the cost effectiveness of, loran-C modernization activities, including transmitter replacements, should this schedule be changed.[29]

The DOT strongly disagreed with the GAO conclusions and recommendations regarding the Coast Guard's lack of attention to GPS technology development, stating that:

1. It is premature and possibly not in the best interest of the Government to develop low-cost GPS receivers for civil use;

2. Based on the Defense Department's current policy on signal accuracy, GPS will not meet certain existing and potential requirements, while differential GPS may not help to provide higher accuracies; and

3. The Coast Guard has spent $1.6 million to evaluate GPS.[30]

In response to the conclusions and recommendation that the Coast Guard could potentially phase out loran-C by the early

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[27] Ibid., pp. 1-2.
[28] Ibid., p. 3.
[29] Ibid.
[30] Ibid., p. 6.

1990's, Transportation also disagreed and commented that a decision today to terminate loran-C and choose a replacement would be premature in view of numerous national commitments and international agreements. The Department contends that a 10-year transition period should begin with a 1986 national decision on the mix of future navigation systems, so that the phaseout of loran-C would be extended into the late 1990's.[31]

The GAO contention that Coast Guard replacement of existing transmitters is unnecessary and should be terminated was countered by the DOT comment that replacement of the vaccuum-tube transmitters is necessary to provide reliable loran-C service through the late 1990's. Current transmitters cannot be maintained effectively because of their age and the lack of reliable sources for spare parts. As noted above, the solid-state transmitters also offer economic benefits such as reduced operating and maintenance costs and reduced staffing levels.[32]

Modification of the Radionavigation Aid Program and Possible Transfer of Functions

There have been suggestions on ways by which many Coast Guard programs might be curtailed or how certain functions or entire programs might be transferred elsewhere in the Federal Government or to State and local governments or private groups. In the case of the radionavigation aids program, however, there has also been the suggestion that the current Coast Guard radionavigation program be augmented as well.

The U.S. Navy's TRANSIT doppler satellite navigation system was made available to the civil community when it became operational in 1967. Since civilian users of that system now account for 93 percent of all users, and since the Navy plans to phase out TRANSIT in favor of the NAVSTAR GPS, under development by the DOD, many feel that the Coast Guard should assume responsibility for operating TRANSIT. In a recent study on national goals and objectives for ocean services, the National Advisory Committee on Oceans and Atmosphere [NACOA] specifically recommended that such a transfer be made.[33] NACOA's concern was that, with Navy phaseout of TRANSIT and continued current policy of restricting precise GPS navigational information to military users, there will be a continued need for operation of TRANSIT just to meet the level of navigation services now available to the civil sector.

The Coast Guard recognizes the value of TRANSIT to civil maritime interests, but also makes the point that it has only part-time resources available to devote to this system, noting that it could not assume TRANSIT operation without a significant increase in personnel and funding. There is an assumption by the Coast Guard that GPS will provide a fully adequate replacement for TRANSIT to meet navigational needs of civil users in the ocean and coastal areas; however, it also recognizes a need for higher accuracy than

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[31] Ibid., p. 9.
[32] Ibid., p. 13.
[33] National Advisory Committee on Oceans and Atmosphere. "Ocean Services for the Nation. National Ocean Goals and Objectives for the 1980's." Washington, D.C., January 1981, p. 41.

that provided for the safety of general navigation in connection with specialized uses, such as marine scientific research, hydrographic surveying, and petroleum exploration. Though the Government does not have an absolute commitment to satisfy these specialized requirements, it attempts to meet them if they can be achieved at a cost that is justified by benefits to the national interest. The Coast Guard feels, however, that there is no justification to continue TRANSIT beyond 1992 and supports the Defense Department plans to terminate TRANSIT and replace it with GPS after 1992. If the Coast Guard should be directed to assume operation of TRANSIT, the most probable approach would be phased-in takeover of the existing Navy-operated system.[34] The Coast Guard has identified the following resources required by the Navy to operate TRANSIT during 1980, and it is assumed that at least the same level of resources would be required for Coast Guard operation in the near future: 14 Naval officers, 65 enlisted personnel, 140 civilian personnel, and about $13 million in operating expenses, not including launching expenses for replacement satellites.[35] The Coast Guard does provide information to the public on the operation of TRANSIT, based on messages received at district commanders offices from the Navy TRANSIT project office. This information is rebroadcast by Coast Guard centers to the public by means of radio—voice and CW—as notices to mariners.[36] There are no current proposals by the Coast Guard to increase this service or to assume operation of the system upon phaseout by DOD.

NACOA has also recommended in its study that the United States should "establish * * * a mechanism to provide for representation of the interests of civil users of navigation and positioning systems in policy and operational planning for satellite and other navigation systems."[37] Presumably, this mechanism would be established within the Coast Guard. The Coast Guard acknowledged its responsibility to represent interests of the civil maritime community in national navigation planning and recognizes itself as the appropriate central point of contact for civil users of TRANSIT and NAVSTAR GPS systems regarding matters of policy and planning. It is noted, however, that this Coast Guard role is bounded both by limited responsibility and by limited resources. When the DOD, with ultimate authority over operation of these systems, asks the DOT for advice and assistance in assessing civil needs and impacts, the Coast Guard intends to provide such input to the best of its ability, in this way serving as a mechanism for civil users to state their views on the TRANSIT and NAVSTAR GPS systems.[38] The Coast Guard participates in the planning of NAVSTAR GPS through representation by Coast Guard officer in the NAVSTAR project office and through participation with the DOD in preparation of the Federal radionavigation plan.[39] There is also underway

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[34] Letter from Vice Adm. R. H. Scarborough, Vice Commandant of the Coast Guard, to Dr. John A. Knauss, Acting Chairman of NACOA, dated Apr. 7, 1981. (Reply to recommendations for the Coast Guard in the NACOA report, "Ocean Services for the Nation.")

[35] Ibid.

[36] Radionavigation Division, Office of Navigation, U.S. Coast Guard. Private communication.

[37] National Advisory Committee on Oceans and Atmosphere. "Ocean Services for the Nation" p. 42.

[38] Letter from Vice Adm. R. H. Scarborough to Dr. John A. Knauss, dated Apr. 7, 1981.

[39] Department of Defense and Department of Transportation. "Federal Radionavigation Plan." July 1980.

a Coast Guard research project in which the uncoded GPS signal is being examined in terms of its usefulness for civil needs.

Another suggested modification to the Coast Guard's radionavigation aids program has already been discussed in the previous section where it was noted that the GAO recommends discontinuation of the modernization of loran-C stations in view of recommended replacement of loran-C by the degraded nonsecure mode of the NAVSTAR GPS in the early 1990's. Since the conclusions and recommendations of the GAO study and the DOT response to them were summarized earlier, they will not be repeated here.

There have been no serious suggestions that the Coast Guard curtail radionavigation services except as one system might replace another as recommended by the GAO in the case of NAVSTAR for loran-C. If the Coast Guard were faced with the need for reduction in radionavigation services for budgetary reasons or for reasons of shortages of personnel or other resources, it would consider of lowest priority its overseas loran services provided mainly for the benefit of the DOD.[40] Cutting back or eliminating these services by the Coast Guard would not reduce the overall Federal burden, however, since it can be assumed that the DOD would then be required to operate the system to meet its needs.

Within the DOT, the FAA has been making use of existing loran facilities for air navigation purposes. In addition, the FAA has been considering use of loran in the Gulf of Mexico, the interior of Alaska, and over the State of Vermont. Should the FAA expand its requirements for loran-C in support of air navigation for areas over land which are not covered by existing chains, it can be presumed that the costs for such extensions would be borne by the FAA, though it is conceivable that the Coast Guard would be given responsibility, on a reimbursable basis, for operating the additional stations along with the marine stations for which it now has operating responsibility.[41]

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[40] Private communication Radionavigation Division. Office of Navigation. U.S. Coast Guard. Oct. 6, 1981.

[41] Ibid.

DOMESTIC AND POLAR ICE OPERATIONS PROGRAM*

Background and Program Description

The ice operations program of the U.S. Coast Guard is divided into domestic ice operations and polar ice operations. Polar operations are conducted in both the Arctic and the Antarctic, while domestic operations are performed in all U.S. navigable waters where seasonal ice coverage impedes transit, including current and potential shipping routes and harbors in the Arctic.

Domestic icebreaking is normally conducted for two principal purposes: To provide assistance to waterborne commerce and to relieve or prevent the danger of flooding caused by ice accumulation in waterways. In some instances, domestic icebreaking is necessary to support search and rescue operations, and research and development may also require special icebreaking operations. The polar ice operations program is intended to support and promote national interests in polar regions by providing an ice-transiting capability. These interests include the pursuit of scientific study in the Antarctic under sponsorship of the National Science Foundation (NSF) and the operation of bases and conduct of research in the Arctic by the DOD. The Coast Guard also pursues its own research in the Arctic on glaciation, ice properties, and ice drift, requiring an icebreaker as research platform.

The latest operating program plan for ice operations lists the following two program objectives, corresponding to domestic and polar ice operations: [1]

Domestic ice operations program

To facilitate and assist U.S. maritime transportation and other activities in the national interest on ice-laden domestic waters, and to minimize loss of life, property loss and damage, and damage to the marine environment arising from the conduct of such activities in an ice environment.

Polar ice operations program

To cooperate with other organizations to promote the national interests in the polar regions by providing an ice-transiting capability.

Sub-objectives and associated goals for each of these two program objectives were also developed as follows in the program plan: [2]

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* Prepared by Robert E. Morrison, specialist in marine science, Science Policy Research Division.

[1] U.S. Dept. of Transportation. Coast Guard. "Domestic Ice Operations/Polar Ice Operations Program Plan: Fiscal year 1983-92." G-OMI. (Approved Dec. 11, 1980.)

[2] Ibid., pp. 3-3 through 3-7.

Domestic ice operations program

—Provide for the timely movement of maritime traffic through ice-laden domestic waters.

Maintain a 9½-month shipping season on the upper Great Lakes.

Maintain a year-round shipping season in the following areas of the Northeastern United States: Penobscot Bay and River to Bangor, Maine; Cape Cod Canal; Upper Chesapeake Bay; and Chesapeake and Delaware Canal. Also, assist commerce elsewhere on an "as available" basis.

Assist in spring opening of the St. Lawrence Seaway upon request of the St. Lawrence Seaway Development Corporation.

Maintain a year-round shipping season on the upper Mississippi River to Burlington, Iowa, and a 42-week season to Cassville, Wis.

—Provide for the timely movement of maritime traffic through ice-laden Alaskan Arctic and subarctic waters.

Maintain a 105-day shipping season to the Alaskan North Slope from mid-June to October.

Maintain a year-round shipping season to southern ports and southwestern Alaskan waters.

—Minimize loss of life, injury, and property damage loss resulting from flooding due to ice accumulation.

Assist in flood prevention/control at the request of the U.S. Army Corps of Engineers or other responsible agency on an "as available" basis in areas of operation.

Polar ice operations program

—Provide ice-related services in polar regions to other governmental agencies and private organizations when deemed in the national interest.

Meet all Department of Defense and National Science Foundation requirements in Antarctica.

Meet all Department of Defense and National Science Foundation requirements in the Arctic East.

Meet all Department of Defense and National Science Foundation requirements in the Arctic West.

Meet the needs of other governmental agencies and organizations where the national interest dictates.

The Coast Guard's domestic and polar ice operations programs are carried out in five major operation areas. In the Northeastern United States operation area the current icebreaking capability is generally considered by the Coast Guard to be adequate for future needs; however, the Coast Guard does intend to replace the current fleet of East Coast medium harbor tugs with new 140-foot icebreaking tugs.

In the Great Lakes-St. Lawrence Seaway System the navigation season on the upper lakes, on the average, extends from April to mid-January, with incremental extension as ice conditions and commercial demand warrant. During the winter months, the St. Lawrence Seaway is closed, as are the major routes between the lakes. There has been shipping year round between some ports within some of the lakes, expecially Lake Michigan and Lake Erie,

and this might be expanded, depending on commercial demand. According to current plans, by 1983, all Great Lakes harbor tugs will have been replaced by 140-foot icebreaking tugs, providing additional capability for future requirements. The WIND–R class icebreaker now assigned to the Great Lakes is to be replaced by 1985.

Extension of the navigation season in the Upper Mississippi River Basin is possible if sufficient economic justification can be established. There is no current requirement for vessel replacement here, though nonconventional icebreaking techniques may be applied for emerging ice service needs.

In subarctic Alaska, offshore development of mineral resources is expected to require increased ice services. A shallow-draft icebreaking capability will be needed to provide additional ice clearing services as well as other Coast Guard missions in ice-laden waters. In response to increasing marine traffic here, an expanded ice information service is also being contemplated by the Coast Guard.

In the Polar regions, the Coast Guard expects to maintain cooperative support to the DOD and the NSF at the present level for the next decade. There is anticipated, though, increased demand for icebreaking services for commercial navigation as a result of Arctic natural resource development. Aging icebreakers are to be replaced as vessel construction programs are undertaken.

Coast Guard icebreaking facilities include six vessels (WAGB class), whose primary mission is icebreaking. The newest and most capable of these are the 400-foot *Polar Star* and *Polar Sea,* completed 1975–76. The others are two 269-foot WIND–R class cutters (The *Northwind* and the *Westwind*), delivered in 1944–47; the *Glacier,* a 310-foot icebreaker built in 1955 and transferred from the Navy in 1965; and the *Mackinaw,* a 290-foot vessel built in 1944, whose use is restricted to the Great Lakes. As of December 1980, there were 88 other Coast Guard vessels with some capability for icebreaking. These include a variety of harbor, Great Lakes, and river tugs as well as some buoy tenders. Current plans include replacement of older tugs in the Great Lakes and east coast harbors with the new 140-foot icebreaking tugs.

For fiscal year 1980 the estimated cost for Coast Guard polar ice operations is $19.5 million, while the average cost for these operations over the 5 fiscal years, 1976 through 1980, was about $18.8 million annually. These activities required 145 ship operating days for fiscal year 1980, compared with an average of 136 days annually over the past 5 years. Domestic ice operations cost about $4.5 million during fiscal year 1980 and an annual average of $5.8 over fiscal years 1976 through 1980. Domestic ice operations during fiscal year 1980 required 267 operating days, while the average annual number of operating days for the past 5 years was about 300. (Since most of the vessels used in domestic ice operations are also involved in missions other than ice-breaking services, the ship operating days are computed on the basis of 8-hour increments of ice operations. The icebreakers in the polar program, on the other hand, are mostly occupied with those operations, so that an operating day in this program is counted for each 24-hour period on station or in transit in or near the operating area.)[3]

[3] Marine Science and Ice Operations Division, Office of Operations, U.S. Coast Guard. Private communication.

Bases for Responsibilities for the Domestic and Polar Ice Operation Program

DOMESTIC ICE OPERATIONS

In 1936 a Presidential Executive order established national policy on the use of vessels to perform icebreaking operations in channels and harbors that should be kept open for the "reasonable demands of commerce." This Executive order and a series of statutory authorities relevant to domestic icebreaking responsibilities of the Coast Guard are listed below:

E. O. 7521 (1936) Directs the Coast Guard to undertake icebreaking operations for harbors and channels, within the reasonable demands of commerce.

14 U.S.C. 2 States that one of the primary duties of the Coast Guard is to develop, establish, maintain and operate icebreaking facilities on, under, and over the high seas and waters subject to the jurisdiction of the United States; and pursuant to international agreements, operate icebreaking facilities on waters other than high seas and waters subject to the jurisdiction of the United States.

14 U.S.C. 81 Authorizes the Coast Guard to establish and maintain aids to navigation, some of which require the use of icebreaking facilities.

14 U.S.C. 88 Generally authorizes the Coast Guard to aid distressed persons or vessels on the high seas or on waters over which the United States has jurisdiction. Distress may be caused by, among other things, vessels beset in ice, or regions imperiled by flooding due to ice.

14 U.S.C. 92 Authorizes the acquisition of vessels.

14 U.S.C. 93 Authorizes the Coast Guard to maintain icebreaking facilities.

14 U.S.C. 141 Authorizes the Coast Guard to utilize its personnel and facilities to assist, among others, Federal and State agencies. Under this authority, upon proper request, the Coast Guard conducts icebreaking in harbors and channels to relieve flooding conditions.

49 U.S.C. 1651 Establishes as national transportation policy the facilitation of commerce.

Public Law 91-611; Public Law 93-251; Public Law 94-587 Various provisions of these Acts authorize and direct the Coast Guard to participate in a program to demonstrate the practicability of extending the Great Lakes—Saint Lawrence Seaway navigational season, and extend Coast Guard participation through 1979.

POLAR ICE OPERATIONS

The Coast Guard is also authorized to conduct icebreaking operations on waters other than those subject to jurisdiction of the United States. These areas include the high seas and waters of foreign countries, pursuant to international agreement. In these regions, icebreaking is conducted to carry out Coast Guard missions, to support logistical requirements of the DOD and the NSF, and, to provide as available, platforms for scientific research while Coast

Guard vessels are transitting ice-covered regions. In 1965, the U.S. Navy transferred its icebreakers to the Coast Guard in response to a conclusion by the Navy that concentrating all U.S. icebreaking resources in one agency would better serve the national interest. Each year the Chief of Naval Operations transmits to the Commandant of the Coast Guard the Navy's anticipated requirements for icebreaking services.

The bases for conducting polar icebreaking operations include the Executive order and all of the statutes listed earlier that are relevant to domestic icebreaking operations as well as the following memoranda of agreement between the Coast Guard and other Federal agencies requiring icebreaking services:

Revised memorandum of agreement between the Department of the Navy and the Department of the Treasury on operation of icebreakers. July 1965. (This agreement provided for the permanent transfer by November 1966 of Navy icebreakers to the Coast Guard, then located in the Department of the Treasury.)

Memorandum of agreement between the U.S. Coast Guard and the Department of Defense. Coast Guard icebreaker support. June 1979. (This agreement sets forth circumstances under which costs will be incurred for icebreaking and the procedures for interagency coordination, review, billing, and payment of annual costs.)

Memorandum of agreement betwen the U.S. Coast Guard and the National Science Foundation for Coast Guard icebreaker support. September 1979. (This agreement sets forth the circumstances under which costs will be incurred for icebreaking and the procedures for interagency coordination, review, billing and payment of annual costs.)

Resource Requirements for the Domestic and Polar Ice Operations Program

TOTAL PROGRAM COSTS AND MANPOWER REQUIREMENTS

Table 1 summarizes program costs and personnel requirements for fiscal years 1979 and 1980 for polar and domestic ice operations. The table also includes information on the classes of cutters involved in icebreaking and shore facilities which support the operations.

TABLE 1.—ICE OPERATIONS COSTS AND MANPOWER REQUIREMENTS [1]

[Dollars in thousands]

	Polar ice operations			Domestic ice operations		
Cutters	Polar Star, Polar Sea, Glacier, Northwind, Westwind (45 percent)			Mackinaw, Westwind (55 percent), 140' WTGB class, 110' WYTM class, 65' WYTL class, supported by WAGO, WLB, WLM, WLR classes		
Shore facilities	Icebreaker support facility			Ice navigation center		
	Personnel	1979	1980	Personnel	1979	1980
Direct costs [2]						
Vessels	691	$18,990	$21,426	566	$3,376	$3,810
Aircraft		1,607	1,813		764	862
Shore facilities	45	1,061	1,197	3	958	1,081

TABLE. 1.—ICE OPERATIONS COSTS AND MANPOWER REQUIREMENTS [1]—Continued

[Dollars in thousands]

	Polar ice operations			Domestic ice operations		
Cutters	Polar Star, Polar Sea, Glacier, Northwind, Westwind (45 percent)			Mackinaw, Westwind (55 percent), 140' WTGB class, 110' WYTM class, 65' WYTL class, supported by WAGO, WLB, WLM, WLR classes		
Shore facilities	Icebreaker support facility			Ice navigation center		
	Personnel	1979	1980	Personnel	1979	1980
Administration	4	167	189	3	567	640
Other		2,783	3,140		1,919	2,165
Total		24,608	27,765		7,584	8,558
Support costs: [3]		8,736	9,857		2,873	3,241
Total program	740	33,344	37,622	572	10,457	11,799

[1] Data obtained from Coast Guard Office of Operations, Marine Science and Ice Operations Division.
[2] Direct costs: personnel, fuel, O&M, electronics maintenance.
[3] Support costs: other Coast Guard support and administrative costs (overhead).

VESSEL REQUIREMENTS FOR ICE OPERATIONS

As noted above under the description of the ice operations programs, the Coast Guard currently operates six WAGB class vessels, whose primary mission is icebreaking. Four of these vessels (the *Polar Star, Polar Sea, Glacier,* and *Northwind*) and about 45 percent of the time for a fifth (the *Westwind*) are devoted to polar ice operations, while the sixth (the *Mackinaw*) and the remaining time on the *Westwind* are used for domestic operations. (The *Mackinaw* is used exclusively in the Great Lakes.)

The multipurpose vessels used in addition for domestic icebreaking, as of December 1980, included 88 cutters and other vessels in a variety of classes, which are attached to the various Coast Guard districts.[4] The total numbers of each of the several classes of vessels used for icebreaking, as of that date, are given in table 2.

TABLE 2.—*Coast Guard vessels used for icebreaking* [1]

Vessel class and description:	*Number*
WAGB—Icebreaker class	6
WAGO—Oceanographic vessel	1
WTGB—140 foot icebreaker tug	6
WLB—180 foot buoy tender (seagoing)	24
WYTM—110 foot harbor tug	9
WYTL—65 foot harbor tug	15
WLM—157 foot small buoy tender	14
WLR—River tenders	15
WLIC—Construction tenders	1
WLI—Inland tenders	1
WMEC—Medium endurance cutter	2

[1] As of December 1980. Data from Coast Guard Office of Operations, Marine Science and Ice Operations Division.

[4] Information obtained from the Coast Guard Office of Operations, Marine Science and Ice Operations Division, February 1981.

Program Standard for the Domestic and Polar Ice Operations Program

ESTABLISHMENT OF PROGRAM STANDARD

Criteria used by the Coast Guard in deriving its program standards for ice operations were largely operational considerations, anticipated future concepts of operations, and resource requirements developed in other planning documents. It was recognized, for example, that domestic ice operations facilitation activities were likely to expand over the next few years in response to increased water traffic. In particular, projected expansion of Alaskan marine commerce, in response to resource development, was likely to have significant impact on Coast Guard resource requirements. It was also recognized that operation of specialized ice clearing devices for facilitation on inland waters is likely to become a major new activity, provided such devices are technically and economically feasible to obtain. It was further assumed that requirements for cooperation with other agencies in polar regions would likely remain essentially unchanged from present needs over the next 10 years.[5]

The ice operations program plan contains conclusions which are dependent on assumptions regarding potential development of marine commerce in Alaskan waters and on inland waterways, especially the upper Mississippi River. As a result there is a need on the part of the Coast Guard for continued close attention to, and, when appropriate, participation in, national transportation planning in response to developments in these areas.[6]

The program standard is the optimum (level A) at which a program should be conducted. Instead of the rigorous analysis (based on application of economic criteria to the accomplishment of goals) often employed in developing a program standard, the goals, performance criteria, and performance levels in the domestic and polar ice operations program standard were based on qualitative evaluations of the projected demand for services, operating experience, recent icebreaker requirements studies, assumptions of essential minimum specific levels of effort regardless of economic efficiencies, and assumed concepts of future operations.

The Program Standard as derived by the Coast Guard's Office of Operations for the domestic and polar ice operations programs is presented in table 3.

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[5] U.S. Coast Guard. "Domestic Ice Operations/Polar Ice Operations Program Plan: Fiscal year 1983–92." p. ii.

[6] Ibid.

TABLE 3.—PROGRAM STANDARD FOR THE COAST GUARD DOMESTIC AND POLAR ICE OPERATIONS PROGRAM [1]

Goal—Description	Program standard	
	Action (methodology)	Performance Criteria
Flood prevention/control	(1) Conduct I/B during ice seasons in historical areas of operation.[2]	(1) Assistance on resource availability basis.
	(2) Operate SID's on Great Lakes—St. Lawrence Seaway system and upper Mississippi R. System during shipping season.[3].	(2) Assistance on resource availability basis and as incidental to operations for commercial facilitation.
Great Lakes shipping season (Type III facilitation)	(1) Conduct I/B during shipping season.[2]	(1) Two I/B available in critical areas. Preventive I/B conducted as needed in interlake passages. Respond to 95 percent of requests for assistance within 12 hours.
	(2) Operate SID in St. Marys River.[3]	(2) Clearing of ice from channel twice weekly.
	(3) Conduct aerial ice reconnaissance (AIR).[4]	(3) Daily flights over critical areas. Twice weekly flts. over ice areas.
	(4) Operate Ice Navigation Center (INC).[5]	(4) Daily ice/routing info provided to users. Continuous operation during ice season.
Northeastern U.S. shipping season (Type II/I facilitation).	(1) Conduct I/B during ice season.[2]	(1) Preventive I/B in Penobscot River and C & D Canal areas conducted daily or as needed. Assistance provided within 2 days on Hudson River and within 1 day on Upper Chesapeake Bay and Cape Cod Canal. Assistance in other areas provided on resource availability basis.
	(2) Conduct AIR.[4]	(2) Flights over Penobscot and Kennebec R. as needed. 2 flights/week over Hudson R. to Albany. 2 flights/week in vicinity of Long Island.
St. Lawrence Seaway facilitation assistance (Type I facilitation).	(1) Conduct I/B during spring breakout.[2]	(1) Fulfill 100 percent of required icebreaker time requested by SLSDC.
Upper Mississippi R. shipping season (Type II facilitation).	(1) Maintain I/B capability during ice season.[2]	(1) Respond to all requests for assistance to best of ability.
	(2) Operate SID's.[3]	(2) Clear ice from channel twice weekly.
	(3) Conduct AIR.[4]	(3) Two flights/week from St. Louis to Quad Cities, Ill. January to mid-February, from St. Louis to Burlington, Iowa mid-February to April.
Arctic Alaskan Shipping season (Type III facilitation).	(1) Conduct I/B along west/north Alaskan coast during shipping season.[2]	(1) Respond to 95 percent of requests for assistance within 2 days. All requests met within 6 days.
	(2) Conduct AIR.[4]	(2) Average 1 flight/month from Bering Strait to Pt. Barrow. 3 flights/week along Alaskan North Slope.
	(3) Operate INC.[5]	(3) Up to 3 updates/week of ice/routing information. Continuous operation during ice season.
Sub-Arctic Alaskan shipping season (Type III facilitation).	(1) Conduct I/B along southern Alaskan coast and in Bristol Bay-Bering Sea area during shipping season.[2].	(1) Respond to all requests for assistance in Bristol Bay/Bering Sea area within one day from mid-November to May. Respond to 95 percent of requests for assistance along Gulf of Alaska coast within one day from January to April.

	(2) Conduct AIR.[4]	(2) Average 1 flight/month over Bristol Bay/southern Bering sea area. Weekly flight over Cook Inlet/Prince William sound area.
	(3) Operate INC.[5]	(3) Weekly update of ice/routing info. at beginning and end of ice season. More frequent during heavy ice conditions. Continuous operation during ice season.
DOD/NSF support in Antarctica	(1) Deploy I/B from Dec. to Mar.[2]	(1) Meet all documented requirements.
DOD/NSF support in Arctic East	(1) Deploy I/B during winter and summer.[2]	Do.
DOD/support in Arctic West	(1) Deploy I/B during winter and summer.[2]	Do.
Support of other Government agencies in polar regions.	(1) Deploy I/B as required.[2]	(1) Meet all requirements determined to be in the national interest.

[1] Adapted from the U.S. Coast Guard Domestic Ice Operations/Polar Ice Operations Program Plan: Fiscal year 1983–92.
[2] I/B—Icebreaking operations.
[3] SID—Specialized ice device(s).
[4] AIR—Aerial ice reconnaissance.
[5] INC—Ice Navigation Center.

As noted earlier, services provided under the domestic and polar ice operations programs fall into three categories: (1) facilitation of waterborne traffic; (2) cooperation with other agencies in polar regions; and (3) flood control and prevention. The level of effort for polar cooperative services has been relatively well established through formal identification of requirements for ice services, and the conduct of a major portion of these services on a cost reimbursable basis places economic justification responsibility on the DOD and the NSF, recipients of the services. Flood control services, provided on an as available basis at the request of the U.S. Army Corps of Engineers, does not justify resource changes by the Coast Guard on the basis of these services alone. The third category of services, however, that is, facilitation of waterborne traffic on ice-laden waterways, encompasses a wide range of possible levels of effort and derived benefits, so that the Coast Guard is responsible for determining and justifying the appropriate level of effort.

DISCUSSION OF THE PROGRAM STANDARD

There have been no formally expressed challenges to the Coast Guard's approved program standard for ice operations, either from other Federal agencies or from marine industries and the general public.

It has been recognized that quantification of the costs of inputs and benefits of outputs for such a program is difficult as is the case with most public service programs. In particular such analysis is hampered for two very basic reasons:

1. An inability to adequately quantify the benefits derived from accomplishment of goals; and
2. The difficulty of projecting cost/benefit information from historical data due to major anticipated, but unspecified, changes in the future supply and demand of Coast Guard ice services in certain areas of operations.[7]

As noted earlier, these difficulties apply primarily to the Coast Guard's justification of performance levels for domestic ice services to facilitate transit as opposed to polar services whose justification is largely the responsibility of other Federal agencies and flood prevention and control services, which are provided on an as available basis in assistance to the Army Corps of Engineers.

A recent study prepared by the Coast Guard for the DOT and the OMB made the following observations and criticisms of the ice operations program standard: "The analysis of those resource requirements to carry out the desired accomplishments appears sound. However, the actual program standard is judgmental in several areas. One of the program goals is to maintain year-round shipping in the Great Lakes. While this goal is based on the findings of a Corps of Engineers' study and previously stated industry desires, present indications from industry, unions, and other influential elements appear to indicate that only a 10-month season is desired for the foreseeable future. A year-round season appears to be simply too difficult to maintain for practical reasons. Another goal is to

[7] U.S. Coast Guard. U.S. Coast Guard Military Personnel Requirements. (Report to the Department of Transportation and the Office of Management and Budget.) October 1980, p. VII-10.

maintain year round navigation on the Upper Mississippi and Illinois Rivers. Here again, the goal is based on a Corps of Engineers study and the actual practicability; and user/citizen desires for accomplishments of the goal are questionable. Likewise, the goals of maintaining a year-round shipping season in sub-Arctic Alaskan waters and a 105-day shipping season in the Arctic alaskan waters require a study * * * to actually determine the ice operation requirements for this area."[8]

There are, in general, few criticisms of ice services provided by the Coast Guard. The degree of any such criticism is usually dependent on the severity of a given ice season and on the extent of ice coverage. For example, the 1980–81 ice season was especially bad in U.S. Northeastern waters, particularly near Nantucket Island, where marine transportation was partially impeded as a result of severe ice conditions. The DOD and the NSF which request Coast Guard ice services in polar areas, have continued to express satisfaction with services provided, according to the Marine Science and Ice Operations Division of the Coast Guard's Office of Operations.[9]

COAST GUARD NEEDS TO MEET THE PROGRAM STANDARD

According to the operating program plan for the domestic and polar ice operations program, there are various needs in terms of resources required to meet various levels of performance in the provision of ice services.[10] Table 4, adapted from the operating program plan, shows the resource requirements to meet the program standard (level A) and the changes needed to move from level C (current performance level) to level A, for each of 19 milestones associated with the goals listed earlier in table 3. It can be readily seen that the needs expressed by the Coast Guard are in terms of specialized ice devices (SID) for the Great Lakes and the Upper Mississippi River; aircraft hours for aerial ice reconnaissance (AIR) in the Upper Mississippi River, Arctic Alaska, and sub-Arctic Alaska; and cutter days for Arctic Alaska and sub-Arctic Alaska. The final column in table 4 gives the percentge of performance level A (program standard) which is provided at level C.

TABLE 4. RESOURCE/FACILITY REQUIREMENTS FOR DOMESTIC AND POLAR ICE OPERATIONS PROGRAM STANDARD [1]

Milestone	Performance level A					Resource change level C to level A			Estimated percentage of level A at level C
	Resource Requirements			Facilities					
	Cutter days	Aircraft hours	Specialized ice device operating days	Number of icebreaking cutters [2]	Number of specialized ice devices	Cutter days	Aircraft hours	Specialized ice device operating days	
Flood control icebreaking				([3])					100
Flood control specialized ice devices (SID)					([3])				100

[8] Ibid.
[9] Private communication.
[10] U.S. Coast Guard. Domestic ice operations/polar ice operations program plan: Fiscal years 1993-92. Pp. X-5.

TABLE 4. RESOURCE/FACILITY REQUIREMENTS FOR DOMESTIC AND POLAR ICE OPERATIONS PROGRAM STANDARD [1]—Continued

Milestone	Performance level A					Resource change level C to level A			Estimated percentage of level A at level C
	Resource Requirements			Facilities					
	Cutter days	Aircraft hours	Specialized ice device operating days	Number of icebreaking cutters [2]	Number of specialized ice devices	Cutter days	Aircraft hours	Specialized ice device operating days	
Great Lakes icebreaking	582			13					100
Great Lakes specialized ice devices (SID)			48		1			+48	0
Great Lakes aerial ice reconnaissance (AIR)		500							100
Northeastern U.S. icebreaking	238			20					100
Northeastern U.S. aerial ice reconnaissance (AIR)		130							100
St. Lawrence Seaway icebreaking	26			1					100
Upper Mississippi icebreaking	2			1					100
Upper Mississippi specialized ice devices (SID)			80		2			+80	0
Upper Mississippi aerial ice reconnaissance (AIR)		168					+123		25
Arctic Alaskan icebreaking	160			2		+124			30
Arctic Alaskan aerial ice reconnaissance (AIR)		432					+432		0
Sub-Arctic Alaskan icebreaking	255			3		+250			17
Sub-Arctic Alaskan aerial ice reconnaissance (AIR)		212					+212		0
DOD/NSF Antarctic icebreaking	320			2					100
DOD/NSF Arctic East icebreaking	138			2					100
DOD/NSF Arctic West icebreaking	57			1					100
Other polar icebreaking	168			2					100

[1] Adapted from Coast Guard domestic ice operations/polar ice operations program plan: fiscal year 1983–92.
[2] Maximum number required for simultaneous operations.
[3] As available.

The Coast Guard has stated specific improvements and replacements that are necessary for maintaining even current performance levels in icebreaking services. In connection with icebreaking on the Great Lakes there has been a replacement of older vessels with four new 140-foot icebreaking tugs; however, there is a need to place two additional vessels there. In northeastern U.S. waters the Coast Guard is still using the older 110-foot cutters, now about 40 years old. They propose to replace eight of the 110-foot vessels with six of the newer 140-foot cutters in that region.[11]

The GAO in a 1979 study expressed its opinion that the 140-foot cutters, with their expanded capabilities in size and power, were not needed for Coast Guard operations on the U.S. east coast. The GAO, while recognizing the need to replace aging cutters, argued that the procurement of 110-foot cutters should be reconsidered by the Coast Guard.[12] The Coast Guard does not agree with this assessment by the GAO.

[11] Private communication from the Coast Guard Office of Operations, Marine Science and Ice Operations Division.
[12] Comptroller General of the United States. The 140-Foot Harbor Tugboat: Does the Coast Guard Need It on the east coast? PSAD-79-17. Washington, U.S. General Accounting Office, Jan. 15, 1979, pp. ii–iii.

In the Arctic region the Coast Guard feels that it is only meeting minimum mission needs. There is a future need for greater operations in deeper waters; however, icebreaking capabilities with shallow-draft vessels are now very limited. Nothing is currently available for ice services on the Alaskan North Slope. Three shallow-draft icebreakers have been identified by the Coast Guard among essential needs for services in the Arctic in later 1980's and the early 1990's.[13]

Although the Coast Guard has identified a need for specialized ice devices—(SID)—for the Great Lakes and the Upper Mississippi River (see table 4), the concepts for such devices are not fully developed, and, as a result, criteria for operations with such deviecs are highly speculative. Neverthless, the SID may be the Coast Guard's primary response to requirements for extended seasons on inland river systems. In fact, according to the operating program plan, as research proceeds, it may become apparent that a nonvehicle alternative to icebreaking vessels is preferred for clearing ice in clogged channels.[14]

Reduction of the Domestic and Polar Ice Operations Programs or Possible Transfer of Functions

There have been no serious recommendations that the Coast Guard ice operations should be curtailed. In fact, as pointed out earlier, there are anticipated greater needs for ice facilitation in view of probable extended shipping seasons in the Great Lakes and Midwest rivers and in Alaskan waters with anticipated increased shipping there in conjunction with resource development. While some have questioned Coast Guard extrapolated needs for greater ice services to meet these projected expanded shipping needs, there has not been any suggestion that current services ought to be cut back.

There have been suggestions from time to time that portions of the domestic icebreaking operations be transferred to the Army Corps of Engineers. Recently, in the 97th Congress, for example, Representative Arlan Stangeland has introduced H.R. 3411, which would transfer, among other things, responsibilities for establishment, maintenance, and operation of icebreaking facilities from the Coast Guard to the Corps of Engineers. In particular, the functions, powers, and duties currently invested in the Secretary of Transportation for icebreaking under (1) sections 2 and 93 of the United States Code 14 and (2) Executive Order 7521 of December 21, 1936, would be transferred to the Secretary of the Army.[15] The bill was referred jointly to the Committees on Merchant Marine and Fisheries and Public Works and Transporation; however, no further action has been taken.

There have also been various recommendations that parts or all of the domestic ice services be performed by private industries. At least one west coast marine company has recently expressed an interest in contracting for performing some icebreaking services now

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[13] U.S. Coast Guard. Domestic ice operations/polar iceoperations program plan: Fiscal year 1983–92. P. IV–12.
[14] Ibid., p. IV–8.
[15] H.R. 3411. Introduced May 4, 1981.

provided by the Coast Guard; however, there is not currently any expressed desire by the Coast Guard or other Government agencies to contract for such services or to transfer responsibilities from the Coast Guard.

There is also no move on the part of Federal agencies to decentralize polar ice operations now conducted on their behalf by the Coast Guard in response to their stated requirements for ice services. There is little doubt that acquiring such services under contract would be considerably more expensive than under present provision by the Coast Guard, and, in view of the 1965 decision by the DOD to transfer all icebreaking vessels to the Coast Guard, it is not likely that Defense would wish to undertake such operations again. It seems to be generally agreed among Federal agencies that centralization of icebreaking responsibilities within a single agency is most efficient.

COMMERCIAL VESSEL SAFETY PROGRAM*

Basis for Coast Guard Responsibility

The basis for the Coast Guard's responsibility for the commercial vessel safety [CVS] program is grounded in many statutes. Title 46 of the United States Code [U.S.C.] contains most of the laws which require and govern the CVS program activities. This title contains statutory basis for elements of the CVS program such as material safety standards for the design and construction of vessels and equipment on vessels which are subject to inspection laws; material safety standards for maintenance of inspected vessels; material safety standards for documented uninspected commercial vessels; enforcement of vessel/material safety standards for foreign commercial vessels subject to U.S. jurisdiction; development and establishment of various safety standards such as loadlines for vessels, living accommodations on commercial vessels, standards for pilots, minimum complement of crewmembers, number of deck officers needed for safe navigation, licenses for various classes of officers, and enforcement of officer competency; investigation of marine accidents; admeasurement of commercial vessels; administration of vessel documentation laws.

Title 47 includes authorization for the Coast Guard to approve locations of the telegraph operating rooms in ships, the installation of radio telegraph equipment, and to modify or cancel rules concerning radio licenses or equipment.

Laws under title 33 which pertain to the CVS program authorize the Coast Guard to enforce inland rules of the road, the Bridge-to-Bridge Radiotelephone Act, and pollution standards on commercial vessels. Provisions under title 33 require the Coast Guard to enforce laws which prohibit disposal of refuse in the water by commercial vessels, authorize the Coast Guard to revoke the licenses of towing vessel masters for certain offenses, and to require reports of marine accidents.

Laws are included in title 14 which authorize the Coast Guard to board vessels on the high seas and waters over which the United States has jurisdiction for the prevention, detection, and suppression of violations of laws of the United States. Provisions in this title authorize the Coast Guard to promulgate regulations to carry out its statutory responsibilities and certain Coast Guard personnel to act as customs officers. Laws under titles 14 and 43 authorize the Coast Guard to promulgate and enforce regulations pertaining to lights and other warning devices, safety equipment, and other matters related to the promotion of safety of life and property on

*Prepared by William H. Hymes, analyst in environmental policy, Environment and Natural Resources Policy Division.

artificial islands and fixed structures on the Outer Continental Shelf.

The Coast Guard is responsible for maintaining seamen's records and administering vessel documentation laws. Title 18 provides criminal sanctions for the criminal use of seamen's certificates, licenses, or documents, and for falsifying or altering ship's papers. A provision under title 19 authorizes the Coast Guard to revoke documentation of vessels engaged in smuggling. A provision of title 50 authorizes the Coast Guard to document foreign vessels obtained through exercise of the President's emergency powers.

Capital Plant and Personnel Currently Allocated to the CVS Program

The CVS program is executed from 51 field offices located throughout the United States and foreign locations which include Singapore, Kobe, Japan, and Rotterdam, Netherlands. Forty-two of the offices are combined units, designated as marine safety offices [MSO's]. They execute combined duties of the CVS program and the marine environment and systems [MES] program (port security, environmental protection, facility inspection, vessel traffic systems, and captain of the port functions). The remaining nine units are designated marine inspection offices [MIO's] and perform only CVS functions. The 51 units are supported by small marine safety staffs attached to each of the 12 Coast Guard districts. The program is managed and directed by the Office of Merchant Marine Safety, located at USCG Headquarters, Washington, D.C.[1]

With but few exceptions, the units occupy GSA leased spaces. The only capital plant for which the units are accountable consists of office furniture, technical libraries, inspection equipment, personnel protection gear, and some radio gear.

As reported by the Coast Guard,[2] the number of personnel allocated to the CVS program in 1981 include:

Commissioned officers	638
Commissioned warrant officers	193
Enlisted personnel	253
Professional civilians	253
Clerical civilians	330
Total	1667

Performance Standards for the CVS Program, Their Sources, Challenges to These Standards, and Coast Guard Responses

The CVS program functions consist of 10 elements. These elements and standards are discussed below.

1. Administer and enforce vessel material safety standards which pertain to the design, construction and equipment on vessels subject to vessel inspection laws.

All U.S. vessels subject to the vessel inspection laws are required to have their plans reviewed and initial material inspection at the time of construction. Certain designated components of each vessel

[1] U.S. Coast Guard letter (G–CC/104) of Sept. 21, 1981.
[2] Ibid.

system are also factory tested and inspected. The Coast Guard is required to perform these functions on all U.S. vessels for which application is made. The 100 percent standard is required by various sections of title 46 U.S.C.

The Coast Guard has been challenged by some of the ship operating industry with regard to certain plan review functions and inspection of vessels under construction. The challenge is that when a vessel is to be classed by the American Bureau of Shipping (ABS), review of some portions of the vessel's plans and inspection of some portions of the vessel under construction are redundant in that the ABS inspector and the Coast Guard inspector perform the same function.

The Coast Guard has responded to the challenge by signing an agreement with the ABS on June 9, 1981 whereby classed vessel plans which were subject to dual review will be approved solely by the ABS and the approval will be accepted by the Coast Guard as if Coast Guard approved. Additionally, all aspects of a classed vessel under construction which are part of the survey by the ABS for classification will be accepted by the Coast Guard in lieu of Coast Guard inspection. (See Memo of understanding between the Coast Guard and ABS, and ABS Resume in the Addendum, p. 153)

2. Administer and enforce vessel material standards relative to the maintenance of inspected vessels.

All U.S. vessels subject to the vessel inspection laws are required to undergo periodic inspections to insure that they remain in compliance with safety standards. The inspections include examination of the underwater body, internal hull structure, through-hull fittings, machinery, lifesaving equipment, firefighting equipment and navigation equipment. The Coast Guard is required to perform these functions on all U.S. vessels for which an application has been made. The 100 percent standards is required by various sections of title 46 U.S.C.

There have been no significant challenges to the Coast Guard with regard to this standard.

3. Administer and enforce vessel/material safety standards for foreign vessels subject to U.S. jurisdiction.

Foreign vessels, under circumstances described in U.S. law and within U.S. jurisdiction, are required to meet certain U.S./safety of life at sea (SOLAS) standards. The Coast Guard is required to examine 100 percent of all foreign tank vessels entering U.S. waters at least once a year. The standard is required by the Port and Tanker Safety Act of 1978.

There have been no significant challenges to the Coast Guard with regard to this standard.

4. Develop and establish safety standards.

Technical, engineering, and personnel qualification standards are developed and established through prescribed government rulemaking procedures. The safety standards are to assure structural integrity and stability of all new vessel designs as well as effective utilization of firefighting and lifesaving technologies on all new vessel designs and existing vessels. Additionally, they must assure

adequate manning for inspected vessels subject to manning regulations. The Coast Guard is required to develop standards for all inspected vessels as well as some uninspected vessels. The 100 percent standards are required by various sections of title 46 U.S.C.

There have been no significant challenges to the Coast Guard's engineering standards development. There have been challenges to the Coast Guard's manning standards from labor unions and vessel operators. The unions' objections have been that the Coast Guard does not require sufficient crewmembers to insure vessel safety. The vessel operators objections have been that the Coast Guard overlooks the reduced need for personnel as a result of technological innovation and engineroom automation.

The Coast Guard has responded to the unions by stating that it has responsibility only for assuring adequate personnel for manning of navigational and engineroom watches and that the number of persons in addition to the essential watchstanders are best determined through contractual agreements between the unions and the vessel operators. The Coast Guard has responded to the vessel operators by permitting a lesser number of engineroom watchstanders after an automated system has been operated for an adequate trial period and where certain other operational requirements have been met.

5. Administer and enforce personnel standards and qualifications for all licensed and unlicensed personnel.

Pursuant to Federal laws and regulations, applicants seeking employment on specified U.S. vessels must hold appropriate licenses and/or merchant mariners documents issued by the Coast Guard. The Coast Guard must process all applicants for licenses or documents. The 100 percent standard is required by various sections of title 46 U.S.C.

There have been no signifcant challenges to the Coast Guard with regard to this standard.

6. Administer and enforce safety equipment and material standards for offshore platforms.

Offshore oil and gas structures are required by laws and regulations to have certain safety equipment. Routine compliance boarding is conducted to ascertain that this equipment is on board and usable. The Outer Continental Shelf Lands Act Amendment of 1978 increased the scope of the material inspections, requires the Coast Guard to board and inspect all offshore platforms at least annually, and to investigate all personnel deaths and injuries associated with offshore platforms.

To avoid jurisdictional issues with the Occupational, Safety and Health Administration (OSHA) the Coast Guard entered into a memorandum of understanding with that agency on December 19, 1979, which stipulates that the Coast Guard will respond to all employee complaints concerning working conditions and take all necessary action to satisfy the complaints. The Coast Guard furnishes information pertaining to these matters to OSHA.

7. Initiate and conduct investigations of all reported marine accidents, casualties, violation of laws and regulations, misconduct, negligence, incompetence, personnel injuries resulting in incapacity over 72 hours and deaths involving all U.S. vessels and foreign vessels in navigable waters of the United States.

Federal laws require prescribed action upon the receipt of reports of accidents, et cetera. The Coast Guard must process all reports in accordance with the laws and their implementing regulations.

The Coast Guard has been challenged by the news media, plaintiffs and their attorneys, and commercial vessel owers as to the propriety of the Coast Guard conducting an investigation when a casualty involves a Coast Guard vessel and a commercial vessel. To provide a remedy for this situation, the Coast Guard is expected to sign an agreement soon with the NTSB which provides that accidents involving a Coast Guard vessel and a private vessel or facility, will be investigated by the NTSB.[3]

8. Facilitate marine transportation through the admeasurement of commercial vessels.

Federal law and international agreements require that owners of certain types of vessels admeasure their vessels in order to determine the applicability of various international conventions, statutes, and regulations which relate to vessel tonnage. The Coast Guard must process all applications for admeasurement. The 100 percent standard is required by various sections of title 46 U.S.C.

There have been no significant challenges external to the Coast Guard with regard to this standard. The Coast Guard is currently exploring the possibility of reducing its manpower intensity by delegating part of its admeasurement responsibility to the private sector (for example, to the American Bureau of Shipping).[4]

9. Administer vessel documentation laws.

Federal laws require the issuance of vessel registration forms and official numbers to specified vessels. The Coast Guard must process all applicants for documents. The 100 percent standard is required by various sections of title 46 U.S.C.

There have been no significant challenges external to the Coast Guard with regard to this standard.

10. Maintain merchant seaman's records.

Federal law requires the Coast Guard to maintain a merchant service record file on mariners possessing a Coast Guard issued merchant mariner's document or license. Prior to the end of fiscal year 1980, these record files had been maintained by U.S. Shipping Commissioners. However, the Coast Guard appropriation process for fiscal year 1981 [5] eliminated the U.S. Shipping Commissioners by exclusion of funding. Since that time, the Coast Guard has delegated a large portion of the data collection for seamen's records to the private sector. This information must still be transmitted to

[3] Ibid., note 1.
[4] Ibid., note 1.
[5] Public Law 96-376.

the Coast Guard for compilation. In an effort to reduce the backlog of record compilations the Coast Guard is developing simplified forms and is in the process of transferring its exising paper data base to a microfiche system. The 100 percent standard is required by various sections of title 46 U.S.C.

There have been no significant challenges external to the Coast Guard with regard to this standard. However, the Coast Guard is seeking a method of transferring all responsibility for this function to the private sector (e.g. unions, shipping companies, et cetera.[6]

Effectiveness of the Coast Guard in Meeting Performance Standards in the CVS Program

Complaints have been made that the performance standards are being either partially met, or being met with extensive delays in five functional areas of the CVS program. These areas of the program are: (1) new construction inspection and periodic maintenance inspection; (2) investigations of marine casualties; (3) inspection of offshore platforms; (4) implementation of vessel documentation laws; (5) approval of vessel design plans. The perceived effectiveness of the Coast Guard in meeting performance standards in these areas of the CVS program is discussed below.

1. New construction and periodic maintenance inspections

Charges have been made that new construction inspection and periodic maintenance inspection in overseas locations are often delayed because Coast Guard inspectors are not available. Periodically, the overseas units are argumented with personnel from stateside units on a temporary basis. Because of the overall shortage of qualified Coast Guard marine inspectors relative to the workload, stateside units are said to be adversely affected by temporary loss of personnel. Complaints about excessive delays for overseas inspection services have come to USCG mostly from offshore oil recovery and exploration companies. The Coast Guard expects that their recent memorandum of agreement with ABS will mitigate this problem to some extent.

2. Investigations of marine casualties

Complaints have been made that investigations of marine casualties are not being concluded in a timely manner. It is argued that the number of casualty investigations has increased over the past 5 years without any increase in the Coast Guard personnel base to offset the workload, resulting in delays in investigations of 6 to 9 months in some instances. Where litigation or receipt of benefits is dependent upon the conclusion of an investigation the delays are seen as unacceptable. Additionally, investigation results are used to develop analytic data bases for developing rules and regulations. Therefore, excessive delays could prohibit timely analysis and could result in decreased safety. In order to counter some of these problems, in January 1981, the Coast Guard revised the regulations dealing with casualty reporting requirements. The amount of property damage requiring a report was raised from $1,500 to $25,000;

[6] Ibid., Note 1.

reports of intentional grounding without damage to the vessel were excluded; and the requirement to report damage affecting the efficiency of a vessel was deleted. According to the Coast Guard,[7] further efforts to streamline the investigative process are being undertaken and include revision of report formats, reductions in the number of formal marine boards, and more intensive use of the Coast Guard's marine safety information system. Complaints about delays in investigation have been received by the Coast Guard from various legal firms and shipping operators.

3. Inspection of offshore platforms

The Outer Continental Shelf Lands Act Amendments of 1978 (Public Law 95-372) increased the number and scope of inspections required on offshore platforms. The total number of additional personnel required to perform these inspections has not been received. As a result, the Coast Guard reported [8] that it is inspecting only manned platforms (approximately 500) on an annual basis and intermittenly spot checking an additional 2,300 unmanned platforms. No complaints have been received, according to USCG.

4. Implementation of vessel documentation laws

The Coast Guard was given responsibility for implementing vessel documentation laws in 1967 when the DOT was formed. At that time, about 160 positions were shifted to the Coast Guard from the Treasury Department. Since that time, the number of vessel documentation transactions has more than doubled but the number of personnel authorized has remained static. According to the Coast Guard,[9] various banks, shipyard owners, and ship operators have complained to the district commanders, the Commandant, and Congress about resulting long delays. The Coast Guard expects that the Vessel Documentation Act of 1980 will alleviate the problem to some extent. That act and implementing regulations will be effective on July 1, 1982.

5. Approval of vessel design plans

The Coast Guard has received complaints that approval of vessel design plans have been delayed for periods of up to 4 months. Such delays are attributed by the Coast Guard to an increase in ship building activity without an increase in technical personnel. The Coast Guard expects that their recent agreement with the ABS will alleviate this situation. Complaints about this problem have been received from various ship design firms and shipbuilders.

Personnel Resource Requirements for Meeting CVS Performance Standards

Assuming that existing responsibilities continue and the same performance standards remain in force, the Coast Guard concludes that a total CVS program personnel base of 2,000 people is needed to meet the standards utilizing existing approaches. This is an increase of approximately 300 persons over the present base. This es-

[7] Ibid., note 1.
[8] Ibid.
[9] Ibid.

timate has not been specifically challenged. The GAO completed a study dated April 3, 1980, for the chairman of the Committee on Commerce, Science, and Transportation of the Senate entitled "The Coast Guard—Limited Resources Curtail Ability to Meet Repsonsibilities" which concurred in the conclusion that serious personnel shortages exist.

Proposals To Reduce or Reassign Coast Guard Responsibility for the CVS Program

Various proposals have been made to delegate portions of the CVS program to private agencies with appropriate oversight or to other Government agencies. Several recent proposals along these lines are discussed below tegether with sources, arguments for, and arguments against the proposals.

PROPOSAL NO. 1

Shift total responsibility for plan review, inspection during construction, maintenance inspection, casualty investigation, and penalty enforcement to the ABS. This proposal has been made by certain members of industry as well as some Congressmen.

Arguments for proposal No. 1

Enhanced competence of inspectors and investigators would be likely because, as members of the civilian work force, ABS inspectors and investigators would not be subject to frequent transfers.

A decrease in governmental cost would be achieved by eliminating "free" Coast Guard inspection and replacing them with inspections paid for by the vessel owners.

Coast Guard personnel performing plan review, inspections and investigations could be shifted to other Coast Guard programs to alleviate personnel shortages.

Arguments against proposal No. 1

There are approximately 11,000 vessels of various types which are currently inspected by the Coast Guard and which are not under ABS classification. Additionally, in 1979, the Coast Guard conducted 4,665 casualty investigations which involved vessels, 347 casualty investigations involving personnel, 385 recreational boating accidents, and 3,100 administrative proceedings against individuals' licenses and/or documents. Approximately 1,500 foreign tank vessel boardings and examinations were also conducted. Currently, about 1,500 U.S. vessels are classed by ABS and subject to Coast Guard inspection. If proposal No. 1 were adopted it would force all vessels to apply for ABS classification. ABS is likely to be reluctant to undertake this massive increase in inspection workload and, without drastic revision of its present charter, could not undertake responsibility for casualty investigations or penalty enforcement.

Loss of inspection experience would have a severe impact on the Coast Guard's ability to perform other tasks in the CVS program which are not being proposed for transfer. This would include personnel licensing, standards development and foreign tanker vessel boarding. In addition, this inspection experience is utilized in maintaining the safety of the Coast Guard's own vessels.

PROPOSAL NO. 2

Shift responsibility for vessel documentation to another Government agency or to the private sector. This proposal has been made by Coast Guard officials.

Arguments for proposal No. 2

The services provided are facilitative in nature rather than regulatory. Benefits from the services accrue directly to vessel owners, banks, mortgage companies, and the legal profession. The services do no contribute to vessel safety.

Coast Guard could reduce its work force by approximately 160 civilian positions.

Argument against proposal No. 2

Given the workload and the limitations on personnel resources, it is unlikely that another Government agency will be willing to provide vessel documentation services.

No benefit would accrue to the Federal budget in shifting the cost of function from one agency to another, and in the short run the cost would increase.

The delegation of vessel documentation functions to the private sector while retaining Coast Guard oversight, appellate procedures, and international and domestic staandards development probably is impractical at the present time because of the legal and other practical difficulties. Such a delegation would, at a minimum, involve amendments to the Vessel Documentation Act of 1980, the Ship Mortgage Act of 1920, the Jones Act, the Shipping Act of 1916, and the Regulatory Flexibility Act. Even if all the necessary statutory amendments could be made, it is likely that there would still be lingering constitutional and international problems.

Coast Guard is the most prominent maritime agency and, consistent with good management practices, the function should remain where it is presently housed to provide "single-stop" service to the shipping community.

PROPOSAL NO. 3

Shift responsibility for the maintenance of seaman's records to another Government agency or to a private agency. This proposal has been made by Coast Guard officials.

Arguments for proposal No. 3

This service is facilitative in nature rather than regulatory and contributes little to vessel safety. The records are maintained to provide proof of past employment to allow individuals to qualify for pensions, health care, or to certify their service for upgrading of certificates. This type of service is not provided for any other class of nongovernmental employees.

The Coast Guard could reduce its work force by approximately 50 civilian and military positions.

Arguments against proposal No. 3

There would be no reduction to overall Federal budget if the function were shifted to another Government agency and private agencies are not willing to accept this responsibility.

PROPOSAL NO. 4

Shift responsibility for vessel admeasurement to a private agency. This proposal has been offered by Coast Guard officials.

Arguments for proposal No. 4

Admeasurement is a facilitative service rather than a regulatory function. It is a direct benefit to the vessel operators who should bear the cost.

The Coast Guard could reduce its work force by approximately 30 civilian positions.

Arguments against proposal No. 4

No arguments against this proposal have been presented.

The Coast Guard [10] is currently negotiating with ABS in hopes of delegating the vessel admeasurement function to that agency. The Coast Guard would retain oversight authority for purposes for appeal procedures, the development of uniform standards, and the implementation of international agreements.

ADDENDUM

MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED STATES COAST GUARD AND THE AMERICAN BUREAU OF SHIPPING CONCERNING PLAN APPROVAL AND INSPECTION ACTIVITIES FOR NEW VESSEL CONSTRUCTION

I. Purpose:

The purpose of this memorandum is to set forth basic guidelines for cooperation in plan review and inspection of vessels under construction which will be classed by the American Bureau of Shipping and certificated by the Coast Guard. The provisions of this memorandum are not intended to alter existing delegations or arrangements not addressed herein. Navigation and Inspection Circulars 2-72 and 4-73 will be superseded by another Circular implementing this memorandum.

II. United States Coast Guard:

The United States Coast Guard has statutory authority, under the laws governing marine inspection, to regulate in order to promote the safety of life and property at sea and to protect the marine environment.

III. American Bureau of Shipping:

The American Bureau of Shipping is a classification society which provides voluntary classification services for ships and other marine vehicles and structures, and which is authorized by law to perform various functions in cooperation with, and on behalf of, the United States Coast Guard.

IV. USCG Acceptance of ABS Approvals and Inspections:

A. General. Plan review and inspection functions detailed in Attachment (1) and performed by full time employees of the American Bureau of Shipping may be accepted by the Officer in Charge, Marine Inspection, as part of the Coast Guard vessel certification process without review or attendance by Coast Guard personnel. Attachment (2) indicates plan approval, vessel inspection, and oversight responsibilities retained by the Coast Guard.

B. Approval and inspection standards. The standards to be applied by the American Bureau of Shipping in approvals and inspections for the Coast Guard in order of precedence are:

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[10] Ibid., note 1.

1. The requirements of SOLAS or other international conventions to which the United States is a party, implementing statutes, and Coast Guard regulations, including specific industry standards incorporated therein.

2. Rules and standards of the American Bureau of Shipping.

C. Verification. Unless specified elsewhere, copies of the usual ABS approval letters, stamped plans, class certificates, and other ABS documents provided to the Officer in Charge, Marine Inspection will be deemed sufficient for verification of compliance with Coast Guard requirements. ABS acceptances beyond the scope of classification will be noted by specific letters of verification as indicated on Attachment (1). The procedures contained in this memorandum are applicable only to vessels which are classed by the American Bureau of Shipping.

V. Appeals:

Acceptance by the Officer in Charge, Marine Inspection, of any action of the American Bureau of Shipping performed under this memorandum may be appealed according to existing appeals procedures in Coast Guard regulations. In the event of an appeal resulting from any such action, the American Bureau of Shipping, upon request, will provide the Officer in Charge, Marine Inspection, with a statement concerning the status of the matter with respect to class, if applicable.

VI. Long Term Objectives:

The Coast Guard and the American Bureau of Shipping will review areas for future cooperation. Discussions will address procedures for cooperation, types of liaison, methods to communicate difficulties which may arise, and provisions for amendments to this memorandum.

VII. Savings Provision:

The Coast Guard will perform services as requested in accordance with regulations and law. Nothing in this memorandum shall be deemed to alter in any way the statutory or regulatory authority of the Coast Guard or the classification responsibilities of the American Bureau of Shipping.

VIII. Effective Date:

This memorandum shall apply to vessels for which plan approval and construction begins after 1 August 1981. For vessels under construction or plan review on 1 August 1981, this memorandum will become effective as mutually agreed upon by the Coast Guard and the American Bureau of Shipping.

IX. Termination:

This memorandum may be terminated by one party after written notice to the other party.

Signed at New York, N.Y., this 9th day of June 1981.

[Attachment 1]

AREAS OF COAST GUARD ACCEPTANCE OF ABS APPROVALS AND INSPECTIONS

1. Hull structure plan review of conventional steel ships and barges according to ABS Rules for classification. Copies of ABS approval letters and approved plans will be forwarded by ABS directly to the cognizant Officer in Charge, Marine Inspection.

2. Hull structure inspections including welding procedures and welder qualifications, visual inspections, non-destructive tests, and compartment tightness tests.

3. Material affidavits for hull structural steel.

4. Anchors and mooring equipment.

5. Verification of draft marks.

6. Inert gas systems. A letter certifying specific compliance with Coast Guard requirements for inert gas systems will be sent to the Officer in Charge, Marine Inspection.

7. Crude oil washing systems. A letter certifying specific compliance with Coast Guard requirements for crude oil washing systems will be sent to the Officer in Charge, Marine Inspection. The Coast Guard will issue the appropriate acceptance letters.

8. Pipe welding procedures, qualifications, and standard joints.

9. Piping systems inspections and plan approval including thermal and dynamic analyses. Copies of ABS approval letters and approved plans for the following piping systems will be forwarded by ABS directly to the Officer in Charge, Marine Inspection.

a. Ballast,

b. Lube oil,

c. Sanitary and drains,

d. Potable water,

e. Saltwater tank cleaning,
f. Condenser circulating,
g. Vent, sounding, and overflow,
h. Internal combustion engine exhaust,
i. Hot water heating,
j. Cargo refrigeration and air conditioning,
k. Piping and ventilation systems on barges.

10. The Coast Guard recognizes that the above services which are in addition to classification requirements may be subject to additional fee assessments by the American Bureau of Shipping.

[Attachment 2]

AREAS OF COAST GUARD APPROVALS AND INSPECTIONS

1. Structural plan review and inspection of vesels other than conventional steel ships and barges.
2. Intact and damage stability.
3. Approval of vessel specifications.
4. General arrangements.
5. Emergency and safety equipment.
6. Sea trials (jointly with ABS).
7. Life saving systems.
8. Fire protection systems including structural fire protection.
9. Pollution prevention systems and arrangements.
10. Admeasurement.
11. Boilers and pressure vessels
12. Nuclear systems.
13. Marine sanitation devices.
14. Industrial systems.
15. Marine portable tanks.
16. Automation systems and components.
17. Approvals under 46 CFR Subchapter Q.
18. Piping systems except as noted in item 9 of Attachment (1).
19. Electrical equipment and systems.
20. The Coast Guard will maintain oversight of areas listed in Attachment (1) to the degree necessary to fulfill its statutory mandates.

AMERICAN BUREAU OF SHIPPING

The American Bureau of Shipping (ABS), chartered in the state of New York in 1862, is a ship classification society. Such societies establish and administer standards, known as rules, for the design, construction, and periodic survey of merchant ships and other marine structures. Classification certifies adherence to these rules, thus representing that a vessel possesses the structural and mechanical fitness required for its intended service. According to the ABS, a classed vessel is one that provides for the safety of lives and cargoes which the vessel may carry as well as the environment in which it may operate.

The ABS is non-profit, private society with headquarters in New York City, New York. Management responsibilities are vested in the Board of Managers which consists of 60 persons chosen from the 453 members. The members of the society are shipowners, shipbuilders, naval architects, marine underwriters, government representatives, and other persons prominent in their marine field of endeavor.

The society employs technical staff surveyors trained in the skills of naval architecture, marine engineering, and other associated disciplines. As of the end of June, 1980, ABS employed 1,430 exclusive employees which included 561 field surveyors, 251 technical surveyors, 47 research engineers, and 571 other employees.

The ABS is represented in 89 countries by 138 exclusive offices, 44 exclusive suboffices and 101 non-exclusive offices.

The ABS derives income from fees for survey and classification of marine vessels and structures.

RECREATIONAL BOATING SAFETY PROGRAM*

The objective of the recreational boating safety program is to reduce the risk of loss of life, personal injury, and property damage associated with the use of recreational boats in order to provide boaters with maximum safe use of the Nation's waterways.[1]

The basic authority for the recreational boating safety program is the Federal Boating Safety Act of 1971. This act provides for a comprehensive national program having three main objectives: Cooperative Federal and State boating safety programs, improved boat design and construction, and flexible regulation of boat operation. According to the Coast Guard Recreational Boating Safety Operating Program Plan for Fiscal Year 1983–92, approved February 4, 1981, accomplishment of the boating safety objective will be through four broad approaches:

(1) *Standards.*—Identify, justify, and establish cost effectiveness standards and regulations, insuring that all new boats are built to the established safety standards and that any identified safety related defects on any boat subject to the provisions of the Federal Boat Safety Act are immediately remedied;

(2) *Education.*—Encourage expanded boating education programs by the States, Coast Guard Auxiliary and volunteer organizations to achieve both an increasing percentage of formally educated boat operators (thereby enhancing the general level of operator skills and safety practices) and a greater proportion of recreational boats complying with the mandatory carriage requirements;

(3) *Efficiencies.*—Promote the most effective allocation and utilization of Federal, State, and local boating resources through implementing an effectiveness measurement program, improving the quality of the accident investigations, and improving the existing information system; and

(4) *Uniformity.*—Seek greater uniformity and comity in Federal, State, and local boating laws and regulations to insure more effective boating law enforcement promoting the expansion of the State and local enforcement activities.

As may be deduced from these approaches, Coast Guard implementation of its responsibilities for boating safety consists, primarily, of regulating the boat-building industry, implementing and coordinating education programs for the boating public, and overseeing law-making and law-enforcement activities of the States and local jurisdictions. "On-the-Water" operations by regular Coast Guard personnel are minimized. Management of the boating safety program is coordinated from the headquarters, through the 12 dis-

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*Prepared by Alva M. Bowen, Specialist in National Defense, Foreign Affairs and National Defense Division.

[1] U.S. Coast Guard Military Personnel Requirements: Report to the Department of Transportation and the Office of Management and Budget. From the Commandant, USCG, October 1980., p. OP–40.

trict offices. Thirty-one three-man boating safety detachments are the operating arm of the program. A unique element of the program is the service rendered by the Coast Guard Auxiliary, an organization of more than 43,000 volunteer boaters. These individuals, using their own boats, augment regular Coast Guard forces by conducting rescue, assistance and patrol operations, education courses, and courtesy marine examinations. The Coast Guard fiscal year 1982 budget estimates, prepared in the DOT, submitted the following workload data for Coast Guard boating safety activities:

	1981 Actual	1981 Estimate	1982 Estimate
Factory visits/inspections	2,205	2,400	2,600
Defect campaigns	217	220	220
Potential units affected	512,369	560,000	610,000
Classroom instruction (student lessons in millions)	$1.00	$1.10	$1.20
Courtesy marine examinations (auxilary)	290,451	325,000	350,000
Assists (auxiliary)	20,718	22,000	23,000
Boat boardings	38,000	31,000	32,000

Resources Assigned

No regular Coast Guard water or aircraft are assigned exclusively to the recreational boating safety operating program, and part-time assignments do not represent a significant claim on those assets. A U.S. Coast Guard military personnel requirements study, completed in 1980, identified man-years chargeable to the RBS program equivalent to 482–485 man-years. The fiscal year 1983–92 operating program plan projects about 495 equivalent man-years for fiscal year 1983. The operating program plan projects $4.461 million chargeable to the program in fiscal year 1983, in addition to man-power costs.

Performance Standards

To achieve the overall goal of the recreational boating safety program stated at the beginning of the section, the Coast Guard has identified four subobjectives. For each subobjective goals have been established, along with related milestones. To accomplish the milestones, program standard elements have been identified and criteria established to evaluate progress. There are 9 goals, 30 milestones, 13 program elements, and 33 criteria, as detailed below. According to Coast Guard personnel, these were developed through a lengthy involvement with all aspects of recreational boating, using an extensive clientele and accident data system.

SUBOBJECTIVE ONE

Reduce the risk from engineering design, and/or construction related deficiencies on boats and associated equipment.

(1) Goals

Ensure that all new boats and associated equipment meet minimum safety related standards of performance; and
Ensure that identified safety related defects are corrected.

(2) Milestones

Develop minimum mandatory and advisory safety standards;
Conduct product testing;
Conduct the factory visitation program;

Administer the imported boats program;
Provide technical information and guidance to the manufacturing community;
Perform defect investigations; and
Administer defect cases and campaigns.

(3) Program standard elements

Develop minimum standards and regulations;
Conduct compliance monitoring function and administer associated campaigns;
Administer civil penalties, noncompliance cases/campaigns;
Provide technical information to the manufacturing community; and
Perform defect investigations and administer the associated campaigns.

(4) Criteria

Develop necessary safety standards and operator regulations to reduce boater risks to an acceptable level;
Test 100 percent of those boat types and appropriate associated equipment believed to be in noncompliance;
Process 100 percent of imported boat declarations;
Process 100 percent of the notices of boarding/reports of violation and manufacturer violations;
Perform informal/technical visits and industry briefings to recrational boat manufacturers;
Develop necessary design guidelines, demonstration hardware and pamphlets, and respond to initial inquiries from the manufacturing community;
Investigate all potential safety related defects;
Test 100 percent of those boat types and associated equipment found to have safety related defects; and
Analyze 100 percent of reports received and monitor all active campaigns.

SUBOBJECTIVE TWO

Reduce the risks from lack of safety equipment, operator inefficiency and lack of knowledge.

(1) Goals

Expose boaters to Boating Safety information;
Ensure that boat operators have participated in a Boating Safety education program; and
Ensure that recreational boats are in compliance with mandatory carriage requirements.

(2) Milestones

Support Coast Guard auxiliary activities;
Establish news media contacts;
Develop mass media campaigns;
Visit key boat shows annually;
Perform state liaison activities to encourage state education programs;
Support and administer the Coast Guard Auxiliary;
Develop "Minimum Education Guidelines" for boat operators;

Coordinate activities for a National Education Program;
Develop minimum Federal carriage requirements;
Perform RBS on-the-water operations;
Administer the Civil Administrative Penalty Program for boating law violations;
Perform state liaison functions; and
Perform training of Coast Guard, state and local enforcement personnel.

(3) Program standard elements

Administer civil penalties, non-compliance cases/campaigns;
Perform state liaison for development of programs;
Support and administer the Coast Guard Auxiliary;
Coordinate the national boating safety education program;
Perform boardings after SAR and enforcement training;
Provide public information; and
Develop minimum standards and regulations.

(4) Criteria

Visit key boat shows;

Personally contact 100 percent of TV stations, 25 percent of the radio stations and 25 percent of newspapers/applicable magazines;
Implement necessary mass media campaigns;
Conduct visits to Auxiliary units;
Process 100 percent of data reports and maintain Auxiliary personnel records;
Provide administrative rulings, Courtesy Marine Examination (CME) Facility decals and public relations support;
Cover 50 percent of Auxiliary patrols with Coast Guard orders;
Provide technical review and support of public education courses/member training;
Develop minimum education guidelines. Review 100 percent of courses submitted for compatability with "guide";
Develop corrective actions for 100 percent of identified risks;
Implement procedures to encourage nationwide offering of boating safety courses in the school system;
Establish and maintain liasion with the State Boating Law Administrators;
Attend 100 percent of all state legislative committee hearings on boating safety related bills and the five regional meetings of the State Boating Law administrators;
Organize and administer 12 district and state seminars;
Process 100 percent of regatta patrol permits, and assure regattas are patrolled as necessary;
Train Coast Guard, other Federal, state and local enforcement personnel; and
Provide for boarding after assistance cases.

SUBOBJECTIVE THREE

Insure effective allocation and utilization of Federal, state and local boating resources.

(1) Goal

Determine program requirements through effective analysis and data processing.

(2) Milestones

Perform accurate accident investigations;
Implement effectiveness measaurement programs; and
Improve management information systems.

(3) Program standard elements

Perform accident investigations; and
Improve management information systems and implement effectiveness measurement program.

(4) Criteria

Investigate 350 accidents per year in-depth and all fatalities on joint waters. (approximately 900 per year);
Review/process all boating accident reports. (approximately 6,000 per year);
Meet 100 percent of all requests for data processing and/or analysis;
Process 100 percent of all transactions; and
Perform necessary program development and analysis functions.

SUBOBJECTIVE FOUR

Encourage greater uniformity, cooperation, and participation among Federal agencies, States and local entities.

(1) Goals

Ensure all states and territories adopt and administer effective boating programs;
Promote expanded state boating law enforcement efforts and phase down Coast Guard enforcement activities; and
Coordinate the development of local water safety councils.

(2) Milestones

Perform state liaison functions;
Administer state financial assistance program;
Train state and local enforcement personnel;
Standardize all boating laws and regulations;
Coordinate the development of implementation guidelines; and

Encourage participation by representatives of national organizations in local councils.

(3) Program standard elements

Coordinate the National Boating Safety Education Program;
Perform RBS on-the-water operations and enforcement training; and
Administer the state financial assistance program and administer the "5%"Grant Program.

(4) Criteria

Develop a minimum education guide. Review 100 percent of courses submitted for compatability with "guide";
Develop corrective actions for 100 percent of identified risks;
Implement procedures to encourage nationwide offering of boating safety courses in the school system;
Process 100 percent of regatta permits and assure regattas are patrolled as necessary;
Train Coast Guard, other Federal, state and local enforcement personnel;
Provide for boardings after assistance cases;
Review 100 percent of the grant reports and monitor state assistance program. Investigate possible continuation of the "5%; Grant Program; and
Perform periodic and close-out audits.

Effectiveness in Meeting Performance Standards

According to the anaylsis presented in the Coast Guard recreational boating safety operating program plan for fiscal year 1983–92, resources projected for fiscal year 1983 should be able to satisfy 75.3 percent of man-hour requirements and 70 percent of fiscal requirements to achieve "optimum" performance. However, the Commandant of the Coast Guard testified before the House Subcommittee on Coast Guard and Navigation on March 17, 1981, that, "We are getting pretty close to the point of no return with respect to additional investment in that program." Admiral Hayes made the point that, over the 10 years since passage of the Federal Boat Safety Act of 1971, we have seen a definite decline in the fatalities per 100,000 boaters, but it seems now to have stabilized at a level that suggests we are getting to a point of no return on additional investment.[2]

This would seem to indicate that "optimum" performance has been reached and could be maintained by the present level of resource support, augmented to keep up with the growth of the boating population, which is projected to grow about 4- to 6-percent annually in the coming years.

Proposals To Reduce or Reassign Responsibility for this Program

So long as the uniformity requirements of the Federal Boating Safety Act of 1971 remain in effect, the Coast Guard, or some other Federal agency, will be required to administer the program. However, under budgetary and other pressures, the Coast Guard is in the process of turning much of the execution of the program over to other entities. For example, law enforcement aspects are more and more left to the States, and the Coast Guard Auxiliary is being

[2] U.S. Congress. House. Committee on Merchant Marine and Fisheries. Subcommittee on Coast Guard and Navigation. Hearings, Coast Guard Authorization, fiscal year 1982 (H.R. 2559) and Oversight. Coast Guard Miscellaneous, part I, serial No. 97-2. 97th Congress, 1st session, Washington, U.S. Government Printing Office, 1981.

stimulated to assume a greater role in education and marine inspections. Aside from these self-induced changes, there seems to be little pressure to change the Coast Guard role in recreational boating safety.

SEARCH AND RESCUE PROGRAM*

The objective of the Search and Rescue (SAR) Program is to minimize loss of life, injury and property damage by rendering aid to persons and property in distress in the marine environment, including inland navigable waters.[1]

Search and rescue is the mission which the public most readily identifies with the Coast Guard, and this mission is one of the Coast Guard's earliest and most traditional functions. United States Code, title 14 gives the Coast Guard authority to establish, maintain and operate SAR facilities throughout the United States and its possessions. A national search and rescue plan became effective in 1956, allowing coordination, by interagency agreement, of all available search and rescue facilities. Three SAR regions were delineated by the plan: inland, maritime and overseas. The Coast Guard is the designated coordinator for the maritime SAR region. This region comprises those waters subject to jurisdiction of the United States, its territories and possessions and certain high seas areas. Other Federal, State and local agencies provide reciprocal support for SAR missions occurring in the maritime region and the Coast Guard similarly is authorized to respond to calls for assistance from SAR coordinators in the other regions. The Coast Guard also has responsibility for international SAR matters.

Coast Guard assets employed in search and rescue include aircraft, ships, boats, and a command, control, and communications system. Sixty-eight percent of SAR sorties are made by boats—77 percent of SAR cases involve recreational boats. According to the USCG operating program plan for fiscal year 1983–92, 96.9 percent, approximately 78,000, of the SAR cases handled by the Coast Guard in fiscal year 1978 occurred within 20 miles off shore. By 1993, according to a projection in the program plan, the percentage might increase to 98.7 percent.

SAR program performance is critically sensitive to response time (see chart 1). Up until about 3 hours' response time in a nominal SAR case, the probability of a death occurring is relatively constant at about 2 percent. Thereafter prospects for survival decrease rapidly. Currently, Coast Guard average response time is 2.2 hours and 72 percent of all cases are concluded within 3 hours of distress initiation. SAR program objectives seek to maximize ability to respond effectively to SAR incidents in minimum time.

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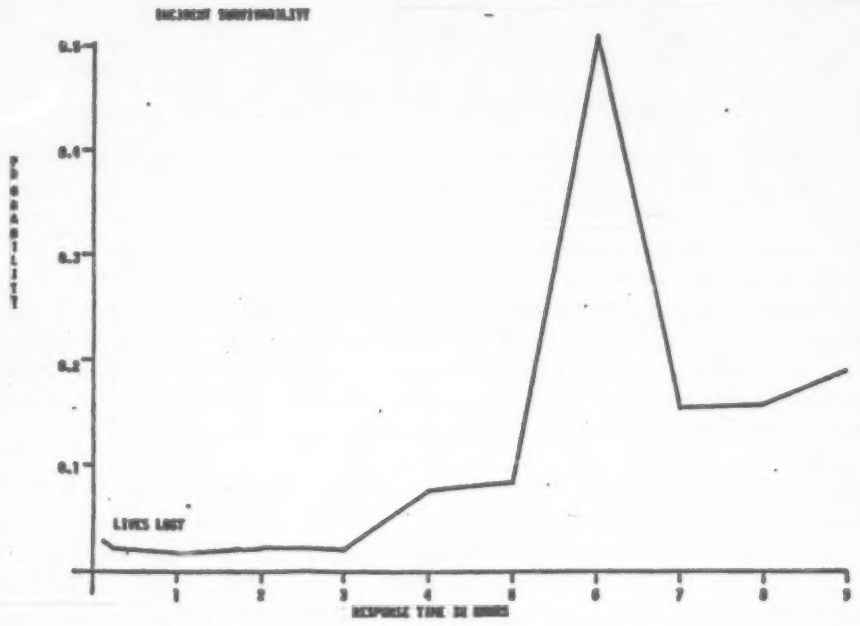
* Prepared by Alva M. Bowen, Specialist in National Defense, Foreign Affairs and National Defense Division.

[1] "USCG Military Personnel Requirements: Report to the Department of Transportation and the Office of Management and Budget" October 1980, p. OP-49.

Chart 1



Source: USCG Operating Program Plan for the Search and Rescue Program, Fiscal Year 1983–92. p. 80.

FISCAL YEAR 1982 COAST GUARD BUDGET ESTIMATES—WORKLOAD

	1981 Actual	1981 Estimate	1982 Estimate
Responses to search and rescue cases serviced by Coast Guard regular forces or Coast Guard regular forces or Coast Guard directed forces (aux.)	81,380	83,244	84,924
Lives saved	4,567	4,661	4,762
Persons otherwise assisted	178,284	181,956	185,628
Property loss prevented (dollars in thousands)	1,235,000	1,316,000	1,351,000

Resources Assigned

The USCG operates the largest search and rescue organization in the world. Resources devoted to this purpose include boats, cutters, aircraft, and rescue coordination centers ashore, all tied together by an extensive communication network of coastal radio stations, specialized landline circuits and numerous communications centers which monitor marine and aircraft distress radio frequencies. The Coast Guard also operates the Automated Mutual Assistance Vessel Rescue System, a voluntary movement report system which, by keeping record of the locations of merchant vessels at sea, facilitates obtaining or providing assistance by one mariner to another.

Because most of the Coast Guard assets available for SAR are also employed for other missions, accounting for the resources actually used for SAR in any given period of time is a complex task. In their military personnel requirements study for the DOT and the

OMB completed in October 1980, the Coast Guard made the following breakdown of personnel required to conduct the various programs at current levels.[2] The share of Coast Guard assets devoted to SAR can be inferred from these totals.

	BA	CVS	ELT drugs	ELT fish	IO	MEP	MSA	OP/MP	PSS
Cutters		1	1,893	1,743	1,851	100	281	751	109
Aviation			364	345	122	540	61	234	14
Boat and direct	8	1,148	22	22	12	566	86	168	1,355
Program totals	8	1,149	2,279	2,110	1,185	1,205	428	1,153	1,478

	RA	RBS	RT	SAR	SRA	CT	OCS	R&D	PA	Personnel totals
Cutters	77	29	9	573	1,881	444	30		71	9,043
Aviation	113			1,442	228					3,463
Boat and direct	1,489	453	266	5,835	1,416					12,846
Program totals	1,679	482	275	7,850	3,525	444	30		71	25,352

Funding in recent administration budget requests that can be attributed to the SAR program is as follows:

[In thousands of dollars]

	1980	1981	1982
Operating expenses	293,074	327,584	369,068
Acquisition, construction, and improvement	50,690	65,301	65,777
Research and development	1,178	2,330	3,455

Performance Standards

The SAR program standard has a series of elements which have been developed on the basis of experience, acceptable performance and acceptable levels of risk. These elements measure the attainment of the program objectives, as represented by the program goals and milestones. Five goals have been defined. They deal with receipt of distress calls; timely response; successful search; and effective rescue of persons, vessels, and aircraft in distress. Tasks performed in meeting these goals support the Coast Guard's statutory authority to maintain and operate rescue facilities found in title 14, United States Code. Program standards are also used to determine optimum levels of operations and resulting resource requirements.

[2] USCG military requirements study, op. cit., p. IV-12.

Goals	Milestones
A.1. Maximize our ability to: (1) Receive knowledge of SAR incidents, (2) Effectively process this information, and (3) Direct appropriate Coast Guard action.	A.1.a. Provide 90 percent SAR communication coverage to a distance of 300 NM offshore and have the capability to directly receive 99 percent of the calls for assistance. A.1.b. Provide the capability to effectively process and evaluate SAR information to aid in selection of appropriate Coast Guard action. A.1.c. Assign an SAR facility to take selected action within 5 minutes of initial notification of a call for assistance.
A.2. Minimize the time to arrive alongside the unit requiring assistance.	A.2.a. Dispatch suitable "Bravo Zero" resources within 30 minutes after unit notification, in 98 percent of SAR incidents. A.2.b. Locate SAR facilities such that rescue units can, following time of resource departure, arrive on scene or in search area within 45 minutes for 90 percent of SAR incidents. A.2.c. Locate 90 percent of the units requiring assistance within 45 minutes after arrival on scene, or in the search area.
A.3. Improve mission performance by optimizing the probability that a dispatched SAR resource will successfully arrive overhead or alongside rescue/recovery assistance to the unit requesting assistance.	A.3.a. The dispatched resource will have no more than a 2-percent probability that an equipment failure will occur. A.3.b. The dispatched resource will have no more than 5 percent probability that weather/sea conditions will exceed resource capability. A.3.c. The dispatched resource will be manned by a fully qualified SAR crew possessing the skill, knowledge, and experience required to operate the rescue vehicle safely and effectively. A.3.d. The dispatched resource will have available rescue/recovery equipment adequate for performing the required mission.
G.1. Improved cooperation between responsible agencies to provide more effective national SAR efforts.	G.1.a. Implement 100 percent of the national SAR plan through improved effectiveness of Interagency Committee on Search and Rescue (ICSAR). G.1.b. Within headquarters and districts, maintain effective liaison between state, local and volunteer SAR groups.
G.2. Improve international cooperation in Search and Rescue.	G.2.a. Persuade signatory governments to implement the Maritime SAR Convention. G.2.b. Maintain an AMVER plot of the worldwide commercial vessels (both U.S. and foreign) which are on offshore or coastal voyages of at least a 24-hour duration.

The percentages of attainment for each milestone are not mandated by law. They have been developed on the basis of acceptable risk and experience, and represent expert opinion on what optimum levels of performance must be. The impressive empirical data base supporting the milestones and the Coast Guard reputation as

premier SAR specialists combine to restrict challenges to their performance standards. An internal audit of the SAR program plan in connection with the Coast Guard military manpower requirements study, previously cited, found the standards acceptable.

Coast Guard Effectiveness in Meeting the Standards

The "Operating Plan for the Search and Rescue Program, fiscal year 1983-92," provides the following tables estimating the agency's success in meeting its SAR goals.[3]

TABLE 1.—PERCENT ACHIEVEMENT

SAR goals	Fiscal year 1978	Fiscal year 1979 partial
Readiness posture	97	87
Distress communications	96	83
Command and control	95	83
Onscene effectiveness	88	88
Mission performance	87	97
Locating	79	80
SAR facility location	77	79
Professionalism	72	93
ICSAR	60	60
AMVER	50	55
National liaison	30	45
International liaison	25	30
SAR response effectiveness	83	88
Total program	71	73

The program plan also presents a table showing lives saved versus lives lost during an SAR case after the Coast Guard was alerted. This "measure of effectiveness" cuts across the functional efforts denoted by the goals in the preceding table.[4]

TABLE 2.—EFFECTIVENESS SAVING LIVES

	LS	LL	Percent
Fiscal year:			
1979 (partial)	6,314	[1] 785	87.6
1978	4,396	1,156	87.8
1977	4,121	1,458	87.9
1976	2,995	1,112	87.1
1975	3,024	1,254	85.5
1974	2,751	1,509	80.5
1973	2,918	1,474	82.0

[1] Approximate.

Although these views of Coast Guard effectiveness in meeting its SAR goals are seldom challenged directly, there have been numerous articles in the media expressing concern over the ability of the Coast Guard to continue to meet its standards for SAR as well as its other responsibilities. The declining material readiness of ships,

[3] "USCG Operating Program Plan for the Search and Rescue Program, fiscal year 1983-92," p. zz-10.
[4] Ibid., p. 134.

boats and aircraft are often cited, with personnel problems and the addition of responsibilities without augmentation of resources usually blamed.[5]

Coast Guard Estimates of Resources Needed To Meet the Performance Standards

According to the Coast Guard military personnel requirements study, performance levels being maintained by today's Coast Guard are achieved in part by depleting current assets without replenishment, in effect, mortgaging the future to pay for the present. For example, planned preventive maintenance checks are not being carried out at prescribed intervals because personnel levels are inadequate and corrective maintenance consumes all the available effort. At the same time, much aging Coast Guard equipment has reached the point where maintenance required per hour of operation is rising rapidly. Under these conditions, performance levels can be expected to decline, eventually, even in the face of heroic efforts. The personnel requirements study calculated a personnel increment at 28,470 needed to arrest the depletion of assets, while maintaining current SAR performance levels. A similar calculation of the increment needed to perform at the optimum level by 1991 was also made by the study. That increment, 64 percent, reflects a 2 percent annual growth in SAR cases projected to occur through 1991, offset by certain technological advances that are expected to decrease requirements for manpower. Since technological advance tends to be costly, the manpower increment needed for optimum performance level is probably not a valid proxy for the overall resource increment to enable optimum mission effectiveness. The operating program plan for fiscal years 1983–92 provides the following estimates to achieve the optimum level of performance by 1992:

	1979 (actual)	1992 (optimum)	Percent change
Cutter days	1,980	4,573	131
Boat hours	89,250	206,790	132
A/C hours	12,485	28,840	131
Crewman billets	7,812	17,284	121

Some portion of the change shown in these figures is due to the assumption that the number of SAR cases will grow at an annual rate of 2 percent.

Testimony by the Commandant of the Coast Guard before the House Subcommittee on Coast Guard and Navigation on November 10, 1981 provided figures for additional cutter, boat, and aircraft needs by 1985 to meet the optimum performance levels. The SAR program share of these additional resources can be calculated from the figures as .41 WHEC, 1.6 WMEC, 6.3 WPB, 2.5 fixed-wing aircraft, and 3.6 helicopters. About $78 million in acquisition costs

[5] See, for example, "Semper Paratus?" Federal Times, June 29, 1981, p. 4; "Coast Guard Awash in a Sea of Troubles," U.S. News & World Report, Aug. 25, 1980, p. 48; "Pleading Poverty, USCG May Cut Back on Patrols," Philadelphia Enquirer, Apr. 20, 1980, p. 15F; "USCG Struggles in Rough Seas," Washington Star, Mar. 16, 1980, p. A1.

would be involved in providing this increment, plus about $19 million per year operating costs.

The reactive nature of search and rescue activity, and the fact that an ongoing SAR usually preempts lower priority operations lends credence to a conclusion that deficits in SAR assets will probably by made up at the expense of other on the water Coast Guard operations unless inadequate maintenance of equipment or inadequately trained personnel intervene. The figures in table 2, which show a relatively level efficiency in lifesaving over the past several years during which the Coast Guard's resources were being stretched thinner and thinner, reinforce this conclusion. If this is a valid understanding of the relative priorities, then any adverse impact in the future from deficiencies in Coast Guard assets for on-the-water operations will most likely be felt last in the SAR operating program.

Proposals To Reduce or Reassign Coast Guard Responsibilities for This Program

There are no serious proposals to completely reassign maritime search and rescue responsibilities to some organization other than the Coast Guard. However, three different kinds of organizations currently share in search and rescue activity, and some pressure exists to enlarge the participation of each of these communities, possibly at the expense of some of the Coast Guard's current responsibilities. The groups are State and local law enforcement agencies, commercial towing and salvage companies, and volunteer boating organizations.

STATE AND LOCAL LAW ENFORCEMENT AGENCIES

These agencies, equipped and staffed to conduct on-the-water operations in connection with enforcement of the laws of their jurisdiction have inherent SAR capabilities and respond to SAR incidents within their areas of responsibility. Almost all of the inland waters for which Coast Guard SAR forces are responsible come under the jurisdiction of a State law enforcement agency and in many cases of a local law enforcement agency also. According to the Coast Guard military personnel requirements study, "there is a general lack of statutory mandates for State and local governments in this area as well as a general reluctance by those governments to expand services in the current fiscal/economic climate." And, "this alternative entails significant problems in providing standardized search and rescue services and with coordination required for responses of a large scale nature." At the same time, while recognizing these drawbacks to total reliance on these agencies, the evidence of efficient coordination between the Coast Guard and State and local marine police for SAR planning is spotty, and leaves the impression that more could be done to make to efficient use of these additional capabilities. Coast Guard rescue stations and marine police stations are all too often located in the near vicinity to one another, and sometimes both agencies respond to the same call for help. A stronger coordination role for the Coast Guard, entailing negotiation of agreements as to areas of responsibility, certification of State and local SAR capabilities, and provi-

sion for Coast Guard SAR coordinators to task State and local agencies in specific SAR cases might enable the Coast Guard to improve SAR performance without the need for additional resources, or with a smaller increment.

COMMERCIAL TOWING AND SALVAGE OPERATORS

These operators complain that the Coast Guard, in responding to nonemergency calls for assistance without charge, interferes with private enterprise. These companies point out that they sometimes have better capabilities to respond than the Coast Guard, but all too frequently are only called in when the Coast Guard finds the situation too difficult to handle. They feel that if more routine towing and salvage work were turned over to private business the Coast Guard would have more time and money to concentrate on saving lives and enforcing the law. They make the additional complaint that the Coast Guard policy of uncritical response to SAR emergencies, with no penalty for the grossest of demonstrated negligent operation or poor maintenance, does nothing to discourage these practices that account for much of the SAR burden. In their view, if more of these offenders were penalized for their negligence, better maintenance and navigation procedures would be stimulated and there would be fewer SAR emergencies.

Fundamental to this complaint is the accuracy with which the Coast Guard is able to classify calls for assistance as either emergency or nonemergency, in most cases almost entirely on the basis of the report from the vessel in distress.

According to the Coast Guard's operating program plan for the SAR program, fiscal years 1983–92, an actual analysis of the SAR community and fiscal year 1979 data base indicates: [6] 24 percent of responses were immediate SAR; 67 percent of responses were preventive SAR; and 9 percent of responses can be considered good will or cost of doing business.

The program plan further notes that while the probability was less than 2 percent that the actual severity of a case was greater than Coast Guard initial classification, the probability that it was less severe than initially classified was 24.6 percent, indicating an understandable and probably correct tendency to err on the side of safety. Nevertheless, the figures show a substantial number of cases wherein a commercial operator might have been able to provide the needed assistance.

According to the Coast Guard, even when such a call can be reliably classified as nonemergency, the onset of bad weather, tides, currents and nightfall can easily turn a nonemergency into a situation involving a high level of risk. For this reason, Coast Guard policy calls for a Coast Guard response even when a commercial towing and salvage operator is known to be responding. If the Coast Guard arrives first and undertakes a tow, it does not surrender the tow to the private towing and salvage operator unless the assisted vessel agrees. Agreement is rarely given since the choice

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[6] "USCG operating program plan for the search and rescue program, fiscal years 1983–92," p. 60.

at that point is between a free tow and one that will cost something.

VOLUNTEER BOATING ORGANIZATIONS

These organizations already provide a substantial portion of SAR response capability. The Coast Guard Commandant testified to the House Coast Guard and Navigation Subcommittee on November 10, 1981, that the Coast Guard Auxiliary now performs 25 percent of all Coast Guard search and rescue, mostly small-boat assistance in low threat environments. Other boating organizations, such as the U.S. power squadrons, have no official role in SAR, but could possibly be engaged. The Coast Guard military personnel requirements study noted, however, that there are effective limits on the use of volunteers, "particularly in their training and in the equipment and vessels they use. The present day Coast Guard was founded, in part, because of the problems encountered by the mostly volunteer U.S. Lifesaving Service in keeping and maintaining an adequate number of trained personnel to respond to SAR incidents along the Coasts and Great Lakes."[7]

Although it is Coast Guard policy, according to the study, to expand the role of the Coast Guard Auxiliary, particularly in operating areas where no regular Coast Guard SAR forces are available, Mr. Aime Bernard, National Commodore of the Coast Guard Auxiliary, testified at the oversight hearings held by the Subcommittee on Coast Guard and Navigation of the House Merchant Marine and Fisheries Committee on September 30, 1981, that:

> The Coast Guard Auxiliary is an all-volunteer organization, which makes it difficult to direct utilization of or greater participation by individual members. What our program is set up to do right now is whatever the individual is capable of doing in the Coast Guard to better that utilization.

Nevertheless, according to the SAR operating program plan there is room for some improvement in coordination and direction of Coast Guard Auxiliary participation.[8]

> All assessments of the SAR Program indicates a strong need to realize the full potential of our volunteer partner, the Coast Guard Auxiliary. If we are to effectively utilize their existing capabilities, then coordination, support, and liaison must be improved, especially at the District Planning and Group Operations Levels. Increased SAR program direction should be provided for Auxiliary program management.
>
> Greater utilization of Auxiliary resources, through expanded use of safety patrols and rescue vehicle standby, could significantly improve both SAR response and area coverage. The Auxiliary stands as one of the most viable alternatives to offset the rapidly expanding growth of recreational boating distress incidents. The Auxiliary attractiveness includes recognition of in-depth local knowledge, proven professionalism, and cost-effectiveness.

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[7] USCG military personnel requirements study, op. cit., pp. VI–59.

[8] "USCG operating program plan for the search and rescue program, fiscal year 1983–92;" p. 167.

MARINE SCIENCE ACTIVITIES PROGRAM*

Background and Program Description

The marine science activities program of the Coast Guard encompasses a wide variety of activities, or elements, which can be grouped into operating, support, and cooperative programs. The overall objectives of this program are to provide marine science support to all Coast Guard programs and to support other national needs. Specific objectives of the marine science activities program are to: First, conduct the International Ice Patrol; second, provide operational oceanographic services for the support of the search and rescue, marine environmental protection, ice operations, and other Coast Guard programs; and third, to cooperate with and provide assistance to other governmental and scientific organizations in support of national marine science objectives.[1]

The marine science activities program included eight elements which were active as of September 1981:[2] The International Ice Patrol, oceanographic cruises, oceanographic services, ice operations support services, marine environmental protection support services, NOAA Data Buoy Office (NDBO) support, weather observation and reporting, and cooperative services.

Each of the active elements is described briefly below, and each is subsequently described in terms of the bases for the responsibilities performed, program standards, and issues for congressional consideration.

THE INTERNATIONAL ICE PATROL

The International Ice Patrol is the only operational element in the marine science activities. The objective of this program is to minimize the hazard of icebergs to North Atlantic marine transportation. Goals associated with this objective include: First, to detect, identify, and track icebergs entering the ice patrol area, and second, to provide iceberg information to shipping transiting the area.[3]

The International Ice Patrol was begun in 1914, after the sinking of the *Titanic,* by the maritime nations of the Inter-Governmental Maritime Consultative Organization to advise shipping of the ice

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* Prepared by Robert E. Morrison, specialist in marine science, Science Policy Research Division.

[1] U.S. Dept. of Transportation. Coast Guard. "Marine Science Activities Operating Program Plan: Fiscal year 1983-92." G-OMI 80. Approved Feb. 9, 1981, p. 1-1.

[2] The current operating program plan for the marine science activities lists 11 elements; however, since publication of the program plan in December 1980, two of these elements—the airborne radiation thermomenter (ART) and the standard sections elements—have been discontinued; a third element, the international marine pollution monitoring pilot project (MAPMOPP), is currently inactive.

[3] U.S. Coast Guard. "Marine Science Activities Operating Program Plan: Fiscal Year 1983-92," p. 3-1.

menace in the northwestern North Atlantic Ocean. Each year during the iceberg season, Coast Guard patrol aircraft and cutters are deployed to locate and identify icebergs which pose serious hazards to navigation. Broadcasts describing the limits of all known icebergs are made daily at 000 and 1200 GMT during the ice patrol season, which occurs during the late winter, spring, and summer months. The length of this season is variable from year to year, and the occurence and southward drift of icebergs are random. In recent years the number of icebergs sighted south of 40 degrees north latitude has varied from zero in 1966 to 1,587 in 1972, and the length of the iceberg season has ranged from a low of 59 days to a high of 189 days in 1966 and 1972, respectively. As a result of this variability, the level of effort expended by the Coast Guard on this mission varies from year to year, depending on the length of the ice patrol season and on the number of icebergs which drift south and their geographical distribution.[4]

OCEANOGRAPHIC CRUISES

The oceanographic cruise element provides oceanographic data in support of other marine science activities elements as well as research and operational aspects of the search and rescue, deepwater ports, and marine environmental protection programs. WAGO and WAGB class cutters, with required equipment and personnel, are deployed for various hydrographic operations which include test and evaluation of instruments, current surveys, and Nansen/STD casts. Cruises are scheduled in response to requirements established by the Coast Guard Oceanographic Unit, the Research and Development Center, or occasionally, other Government agencies. Cooperative cruises with Government and private organizations are not normally scheduled for dedicated cutter time but are accommodated in connection with regular Coast Guard operations. Dedicated cutter time may be provided to another agency, however, when the purpose of the cruise also serves Coast Guard missions.[5]

OCEANOGRAPHIC SERVICES

Under this element, available oceanographic and meteorological data are used to construct computerized surface-current models for support of various Coast Guard operations. In addition to search and rescue operations, the models also have application to pollutant drift prediction and deepwater port planning. Models are being developed for the entire U.S. coastline, including major estuaries.

ICE OPERATIONS SUPPORT SERVICES

This element provides ice information services and technical support for the domestic and polar ice operations program of the Coast Guard. The Instrument Division of the Coast Guard Oceanagraphic Unit, which provides calibrated oceanographic equipment for research and operational field activities and which develops instrumentation for Coast Guard needs, supports the ice operations

[4] Ibid., pp. 4–4, 4–8.
[5] Ibid., p. 4–50.

program by installing and maintaining instrumentation as needed on ice-breaking vessels.

MARINE ENVIRONMENTAL PROTECTION SUPPORT SERVICES

This element supports the Coast Guard's marine environmental protection program through provision of oil analysis, oil spill drift predictions, and other scientific expertise as required. Such support is provided to the Forensic Analysis Laboratory at the Coast Guard Oceanographic Unit and to the field oil identification laboratories.

NOAA DATA BUOY OFFICE (NDBO) SUPPORT

Under this element the Coast Guard operates vessels and aircraft and provides personnel, communications, and base support for the Data Buoy Office of the National Oceanic and Atmospheric Administration (NOAA). Coast Guard involvement in support of the NOAA data buoy program was continued in 1970 when the National Data Buoy Development Project, initially a Coast Guard program, was transferred by a Federal reorganization to NOAA. Under the terms of an interagency agreement, the Coast Guard is the operator of marine support services and facilities for the NDBO and provides Coast Guard military personnel on a reimbursable basis.

The scope of these operations involves the 3d, 5th, 7th, 8th, 9th, 13th, and 17th Coast Guard Districts. Service and maintenance visits to deployed buoys require transportation only and are accommodated by any cutter. The present principal data buoy deployed by the NDBO, a 40-foot diameter discus hull displacing 100 tons, requires the handling capabilities of the WLB class vessel for installation. In addition to NOAA's planned deployment and servicing of data buoys, there are also requests by NOAA for deployment of drifter buoys and unplanned service calls which are handled by the Coast Guard on an opportunity basis. Aircraft support services are random and minimal and are required primarily for locating buoys which have drifted from station. Although Coast Guard communications personnel and equipment at Miami and San Francisco were formally used for relaying environmental data from the buoys, these requirements have recently been canceled since the NDBO has converted all data link functions to a satellite network. Coast Guard personnel support of NDBO includes a technical staff of officers provided on a reimbursable basis at NDBO headquarters in Bay St. Louis, Miss.[6]

WEATHER OBSERVATION AND REPORTING

In pursuit of the Coast Guard mission to collect and disseminate meteorological data for the benefit of the marine community, this element of the marine science activities program conducts a program of weather observation and reporting, providing unprocessed weather data to the National Weather Service of NOAA and to the Navy. Weather observations, collected from seagoing cutters and certain coastal stations, are provided to the National Weather

[6] Ibid., pp. 4–59 through 4–61.

Service; and, in addition, National Weather Service sensors mounted on Coast Guard large navigational buoys transmit data automatically. National Weather Service forecasts are disseminated by the Coast Guard through radio broadcasts to commercial and private mariners. Certain shore stations also maintain visual displays to provide weather warnings to recreational boaters.[7]

Coast Guard cutters and shore stations are equipped with meteorological instruments, and certain cutter classes are authorized a meteorological allowance to provide for monitoring and recording of most of the basic weather data. As part of their general scientific background, Coast Guard marine science technicians receive basic training in meteorology. As in many Coast Guard functions where facilities are used for a variety of missions, no units are dedicated solely to meteorology. Approximately 130 shore stations and 75 cutters report weather data several times daily.[8]

COOPERATIVE SERVICES

Under this element the Coast Guard engages in joint projects with various Federal agencies and provides marine science expertise and resources to further national goals for the ocean and coastal areas. Ships, personnel, and other resources are provided in support of these programs to the extent that such resources are available.

BASES FOR RESPONSIBILITIES OF THE MARINE SCIENCE ACTIVITIES PROGRAM ELEMENTS

The several elements of the marine science program are conducted under a variety of authorities, including international treaties, public laws, Executive orders, and memoranda of agreement between Federal agencies. While some of these elements are carried out on the basis of specific laws and agreements, the remainder have as their basis a number of statutes which permit or require the Coast Guard to support its own programs or those of other agencies through research and services.

THE INTERNATIONAL ICE PATROL

The Coast Guard responsibilities performed under the International Ice Patrol are based on the following Federal statute and two treaty agreements:

46 U.S.C. 738–738d Authorize the Coast Guard to provide the patrol services required for the international ice patrol established therein and to annually report on the services so rendered.

SOLAS 1956 (TIAS 3597) A multilateral agreement regarding financial support of the North American Ice Patrol.

SOLAS 1960 (TIAS 5780) Chapter 5, regulation 5–8 A multilateral agreement regarding the Ice Patrol services and management and costs thereof.

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[7] Ibid., p. 4–34.

[8] U.S. Coast Guard. "U.S. Coast Guard Military Personnel Requirements." (Report to the Dept. of Transportation and the Office of Managment and Budget.) Oct. 1980, p. 27.

NOAA DATA BUOY OFFICE (NDBO) SUPPORT

The Coast Guard provides support services to the Data Buoy Office of the NOAA as discussed above under descriptions of the various elements of the marine science activities program. By formal agreement, the Coast Guard provides vessels, aircraft, communication support, and a technical staff for continuation of this program under NOAA, following its transfer from the Coast Guard in 1970. The several bases for this support are listed below:

Agreement between the National Oceanic and Atmospheric Administration (Department of Commerce) and the U.S. Coast Guard (Department of Transportation) concerning support of the National Data Buoy Center. March. 27, 1972.

Presidential Reorganization Plan No. 4 of 1970 (October 1, 1970) established the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce and, among other things, transferred the National Data Buoy Development Project from the Coast Guard to NOAA.

14 U.S.C. 141 Generally authorizes the Coast Guard to utilize its personnel and facilities to assist other State and Federal agencies, upon request.

WEATHER OBSERVATION AND REPORTING

As noted above, the Coast Guard cooperates with the National Weather Service of NOAA and with the Navy in observing and communicating weather phenomena and in disseminating weather data, forecasts, and warnings. The applicable statutes under which these services are performed are listed below:

14 U.S.C. 90 Authorizes the Coast Guard to establish, operate and maintain ocean stations to provide, among other things, meteorological services.

14 U.S.C. 141 Generally authorizes the Coast Guard to assist other State and Federal agencies upon request.

14 U.S.C. 147 Authorizes the Coast Guard to cooperate with the National Oceanic and Atmospheric Administration (NOAA) in the observation and dissemination of weather information.

MARINE SCIENCE OPERATIONS AND RESEARCH

The Coast Guard is authorized to conduct oceanographic research on its own initiative or in conjunction with other agencies. Oceanographic and meteorological activities provide support not only for the Coast Guard's own operations but also concurrently make available data for other Federal agencies. The Coast Guard also supports other agencies by providing ship platforms for non-Coast Guard research programs on a noninterference basis. Furthermore, the Coast Guard is authorized to study and observe ice and current conditions in the North Atlantic Ocean as they may affect the set and drift of icebergs there.

All of these activities, as encompassed in the elements identified earlier as oceanographic cruises, oceanographic services, ice operations support services, marine environmental prediction support

services, and cooperative services, are authorized on the basis of the following Federal statutes:

14 U.S.C. 2 Specifies one of the primary duties of the Coast Guard is to engage in oceanographic research.

14 U.S.C. 92 Authorizes the Secretary to do all things necessary to carry out the purposes of the Coast Guard.

14 U.S.C. 93 Generally authorizes the Coast Guard to conduct experiments and investigations to assist in the performance of its duties, and to establish shore facilities.

14 U.S.C. 94 Requires the Coast Guard to conduct oceanographic research and to cooperate with other Government agencies as may be in the national interest.

14 U.S.C. 141 Generally authorizes the Coast Guard to utilize its personnel and facilities to assist other Federal and State agencies upon request.

14 U.S.C. 147 Authorizes cooperation with NOAA for meteorological observations and services.

33 U.S.C. 1254 Authorizes the Coast Guard to cooperate with EPA in research related to the removal, prevention, control, and elimination of oil and hazardous substances pollution.

33 U.S.C. 1401-1444 Requires the Coast Guard, jointly with EPA and the Department of Commerce, to conduct research on ocean dumping as may affect oceanic and coastal waters, and the Great Lakes and its connecting waters.

46 U.S.C. 738 Authorizes the Coast Guard to study and observe ice and current conditions in the North Atlantic Ocean as such conditions may affect set and drift.

Resource Requirements for the Marine Science Activities Program

TOTAL PROGRAM COST

Total direct program costs for marine science activities during the fiscal year period 1971 through 1978, in terms of facilities costs, various function costs, and total yearly costs, are shown in table 1. Data for fiscal year 1979 were considered to be representative of current operating levels and were used in developing the current operating program plan. More recent information on direct and support costs for fiscal years 1979 and 1980, along with other data on personnel and facilities, is shown in table 2.

TABLE 1.—MARINE SCIENCE ACTIVITIES PROGRAM COSTS FOR FISCAL YEARS 1971-77[1]

[In thousands of dollars]

Fiscal year	Vessels	Aircraft	Shore	Repair	Training	Administration	Other	Total
1978[2]	1,948	2,782	2,841	0	0	322	914	8,807
1977	[3] 10,361	3,069	2,431	0	0	2,074	2,276	20,210
1976	6,837	579	1,807	456	39	2,412	2,439	14,668
			[5] 5,362					[5] 18,223
1975	5,825	609	1,095	302	53	1,496	1,385	10,765
1974	[4] 14,033	397	1,258	587	0	2,805	3,265	22,351
1973	[4] 24,350	589	1,094	691	17	4,689	5,405	36,836
1972	[4] 24,301	469	1,010	483	0	4,996	4,669	35,931
1971	[4] 25,443	454	3,414	0	13	1,350	3,590	34,164

[1] Adapted from Coast Guard Marine Science Activities Operating Program Plan: fiscal year 1983-92.

[2] Data for fiscal year 1978 and earlier years are from table in Coast Guard Marine Science Activities Operating Program Plan (approved February 9, 1981), pp. 4-91.

[3] Includes costs of cutter services for Ocean Weather Station HOTEL, which was discontinued in fiscal year 1977.

[4] Includes all costs associated with operation of the Ocean Station Vessels (OSV) and OSV support. The OSV program was discontinued in fiscal years 1973 and 1974.

[5] Represents costs of communications/RADSTA, not included in other years.

TABLE 2.—MARINE SCIENCE ACTIVITIES PROGRAM COSTS FOR FISCAL YEARS 1979–80, ALONG WITH OTHER PROGRAM INFORMATION [1]

[Dollars in thousands]

	Personnel (man-years)	1979	1980
Direct costs: [4]			
Vessels	[2] 61	$2,840	[3] $3,204
Aircraft		1,438	1,623
Shore facilities	77	2,550	2,877
Administration	10	127	144
Other		1,297	1,463
Total		8,252	9,311
Support costs [5]		3,191	3,601
Total program	148	11,443	12,912

[1] Data obtained from Coast Guard Office of Operations, Marine Science and Ice Operations Division.
[2] Dedicated oceanographic cutter.
[3] Program costs of all vessels.
[4] Direct costs: Personnel, fuel, O. & M. electronics, maintenance.
[5] Support costs: Other Coast Guard support and administrative costs (overhead).

Note.—Cutter: Evergreen, supported by WHEC, WMEC, miscellaneous other class vessels.
Shore facilities: Oceanographic unit.

RESOURCE EMPLOYMENT

In recent years the marine science activities program requirements for cutters and aircraft have been dictated primarily by five elements—the International Ice Patrol, oceanographic cruises, standard sections,[9] NDBO support, and cooperative projects. In the past the ocean station vessels and ocean weather station *Hotel* accounted for the vast majority of cutter hours required;[10] the effect of discontinuation of these station vessels on cutter requirements is clearly seen in table 1.

The estimated current annual facility and manpower requirements for the marine science activities program are shown in table 3. The data in table 3 are the performance levels for level C (current level) in terms of programs standards for the marine science activities. (The program standards, how they were established, how well they are met, and Coast Guard proposals for improvements to meet the standards are discussed in the next section.)

PROGRAM STANDARDS FOR THE MARINE SCIENCE ACTIVITIES PROGRAM

ESTABLISHMENT OF PROGRAM STANDARDS

According to the Coast Guard's marine science activities [MSA] operating program plan, the program standards were developed "by identifying specific operating elements within the MSA pro-

[9] This program element has been discontinued during fiscal year 1981.
[10] U.S. Coast Guard. "Marine Science Activities Operating Program Plan: Fiscal Years 1983-92," p. 4-75.

gram that support the program subobjectives and goals within the envelope of overall Coast Guard objectives." [11] The subobjectives and goals referred to are listed in the marine science activities program plan [12] and will not be repeated here.

TABLE 3.—MARINE SCIENCE ACTIVITIES PROGRAM PERFORMANCE LEVELS—LEVEL C [1]

Element	Criteria	Annual resource requirements			
		Ship days	Boat hours	A/C hours	Man-years
Ice Patrol	Seasonal (Jan–Jul)			[2] 123	34.5
ART [3]	Monthly			488	3
Oceano Cruise	As required	131			
Oceano Services	Year round				22
Standard Section [3]	do	16			.15
IO Support Service	do				4
MEP Support	do	4			2
MAPMOPP [3]	do	6			
NDBO Support	do	188		30	15
WX Obs & Reporting	do				77.4
Cooperative	do	58		96	12.5
Total		403		[2] 123 614	170.55

[1] Table adapted from: U.S. Coast Guard. Marine Science Activities Operating Program Plan: Fiscal years 1983–92, pp. 5–9.
[2] Indicates dedicated hours.
[3] The Airborne Radiation Thermometer and the Standard Section elements were discontinued during fiscal year 1981; the Marine Pollution Monitoring Pilot Project element is currently inactive.

It was noted in the operating program plan that program standards reflect current effort in each of the program elements as well as perceived requirements of other Coast Guard operating programs, "most of which have not accurately defined the specific support role requirements of the MSA program." [13]

The marine science activities program office developed its standards by observing its program activities, using historical data, and determining whether that level was at standard. The standards are based not only on Coast Guard needs but also on those of other agencies, particularly NOAA and the Navy.

Table 3 shows current annual performance levels (level C), while table 4, from the marine science activities program plan, shows the optimum performance levels needed to perform at the standard (level A), along with the estimated resource changes required to move from level C to level A. It may be noted that, of the program elements which are currently active in the table, only the oceanographic cruises, ice operations support service, weather observations and reporting, and cooperative services elements are considered to be at the standard level.

[11] Ibid., p. 5–1.
[12] Ibid., pp. 3–1 through 3–8.
[13] Ibid., p. 5–1.

TABLE 4.—MARINE SCIENCE ACTIVITIES PROGRAM PERFORMANCE LEVELS—LEVEL A AND CHANGES, LEVEL C TO LEVEL A [1]

Element	Criteria	Annual resource requirements				Annual resource change from level C			
		Ship days	Boat hours	A/C hours	Man-years	Ship days	Boats hours	A/C hours	Man-years
Ice patrol	Seasonal (Jan.–Jul.)			[2] 151	34.5			[2] +29	
ART [3]	Monthly			1,620	9			+1,132	+6
Oceano cruise	As required	131							
Oceano services	Year round				25				+3
Standard section [3]	do	16			.15				
IO Support service	do				4				
MEP Support	do	10			10	+6			+8
MAPOPP [3]	do	10				+4			
NDBO Support	do	281		59	15	+93		+29	
WX obs and reporting	do				77.4				
Cooperative	do	58		96	12.5				
Total		506		[2] 151 1,775	187.55	+103		[2] +29 +1,161	+17

[1] Table adapted from: U.S. Coast Guard. "Marine Science Activities Operating Plan: Fiscal 1983–92," pp. 5–9.
[2] Indicates dedicated hours.
[3] The airborne radiation thermometer (ART) and the standard section elements were discontinued during fiscal year year 1981; the marine pollution monitoring pilot project (MAPMOPP) element is currently inactive.

DISCUSSION OF THE PROGRAM STANDARDS

In an evaluation report of Coast Guard programs prepared internally by the USCG for the DOT and the OMB, it was pointed out that, with the exception of the International Ice Patrol element, the standards are "directly related to the 'real world' situation being experienced." In considering standards for the ice patrol, however, it is noted that a mathematical modeling technique used in an attempt to optimize performance by examining ice season length as independent variable did not predict the resource employment period, since decisions to conduct patrols are dependent instead on the existence of ice in the North Atlantic Ocean below 48 degrees north latitude.[14]

This study also noted that program outputs are based on manhours that do not include requirements to provide for either operational or institutional overhead.[15] It concludes, however, that "all of the resource requirements appear to be based on reasonable assumptions about the current workload and the desired level of performance. The inherent uncertainties about the demand for support services and new projects requiring the program's resources make forecasts of resource needs difficult to quantify." [16]

Recently the Chief of the Coast Guard's Marine Science and Ice Operations Division expressed his opinion that the marine science activities program, in spite of a relatively low priority among Coast Guard operating programs and in view of recent and anticipated budget cuts, had been meeting performance requirements rather well. He noted that both the National Weather Service and the U.S. Navy had expressed continued satisfaction with marine sci-

[14] U.S. Coast Guard."U.S. Coast Guard Military Personnel Requirements," pp. VII–26 and VII–27.
[15] Ibid., p. VII–26.
[16] Ibid., p.VII–28.

ence services they have received from the Coast Guard. Discrepancy reports, provided periodically to the Coast Guard by the Navy as a means of marine data quality control, have indicated significantly low error rates.[17]

It was noted that, in the case of the NOAA Data Buoy Office support element, there have been occasional instances where higher priority Coast Guard missions have superseded cutter support required for servicing the data buoys. When this has occurred, the NDBO has been able to acquire the necessary support services by contract with private marine operators.[18]

COAST GUARD NEEDS TO MEET PROGRAM STANDARDS

The last four columns of table 4 show the specific requirements, in terms of ship and aircraft time and man-years, which the Coast Guard feels would have been needed, as of February 1981, to bring current performance (level C) up to optimum standard (level A). As noted before, three of the elements listed in table 4 are currently inactive, so that the total resource needs would now be reduced accordingly. Remaining desired increases to reach level A are mainly in aircraft hours for the International Ice Patrol, in both ship and aircraft time for support of the NOAA Data Buoy Office, and in added manpower for marine environmental prediction support.

The Coast Guard Marine Science and Ice Operations Division recognizes, however, that budgetary restrictions may reduce marine science activities more severely, so that even current performance levels in the remaining elements may be reduced. Specific planned improvement for the International Ice Patrol includes installation of two side-looking airborne radar systems in C–130 aircraft. The first of these two systems is expected to be delivered and installed during fiscal year 1982. It is further hoped that the oceanographic cruise element can be strengthened in the Pacific area, to provide an ocean survey capability in that area where such services are now very limited. It is estimated that more ship time is needed to meet service needs for the NOAA Data Buoy Office, since the current level of services is now marginally meeting requirements specified in the interagency agreement. Another area of concern to the Marine Science and Ice Operations Division is the provision of weather data and dissemination of weather information for the National Marine Weather Service; in this program element, it is felt that it will soon be impossible for the Coast Guard to respond to all of the service requests from the National Weather Service.[19]

Reduction of Marine Science Activities Program or Possible Transfer of Functions

As discussed in previous sections, there have been reductions in the marine science activities program in recent years. The Ocean Station Vessels and Ocean Weather Station HOTEL, eliminated during the 1970's, reduced requirements for cutter services signifi-

[17] Private communication. Sept 21, 1981.
[18] Ibid.
[19] Private communication.

cantly (see table 1). During fiscal year 1981, the airborne radiation thermometer element, using 488 aircraft hours per year, and the standard section element, requiring 16 ship days annually, were discontinued. In the previous section it was noted that anticipated budget cuts for fiscal year 1983 and subsequent years could result in further significant curtailments in this program.

While it would be possible to transfer some or all of the elements now under this program to other Coast Guard operating programs, there would not necessarily be any savings from such reorganization, since the changes would only be administrative. With the exception of the International Ice Patrol, with about 123 hours of dedicated aircraft time (see table 3), all of the other elements are performed by a variety of ship and aircraft resources, which are often performing multimission services. The Coast Guard Oceanographic Unit, the major shoreside facility under the marine science activities program, serves elements of this program almost exclusively; it is not clear where this unit might be placed in a reorganization which would eliminate or move some or all of all of the current marine science activities elements within the Coast Guard.

It would be possible to transfer some of the elements in the marine science activities program to other Federal agencies; however, other elements clearly serve other programs of the Coast Guard. The oceanographic services, ice operations support services, and marine environmental prediction support elements are clearly in this category, and, unless those other operating program responsibilities were also transferred from the Coast Guard, the support functions provided under the marine science activities program would still be required. The ice patrol responsibility has clearly been assigned to the Coast Guard; it is not clear which agency might be better equipped, both in terms of resources and agency mission, to perform these patrol services. The oceanographic cruise, weather observation and reporting, and cooperative services elements are performed largely for the sake of other Federal agencies or for other institutions in the case of the cooperative services. Transferring these responsibilities to other agencies might release the small portion of the Coast Guard ship, aircraft, and manpower resources which are charged on a prorated basis to these elements, thereby increasing slightly the resources available to other operating programs. It should be recalled, however, that these functions are accomplished most often while the resources are simultaneously being used in the performance of functions associated with one or more other Coast Guard programs, so that the boost in resources available to other programs could be negligibly small. Therefore, the overall cost to the Federal Government could be significantly larger than the current incremental cost to the Coast Guard if agencies such as the Navy and the National Weather Service were required to provide services equivalent to these under their own operating programs or by contract. While the Navy, depending on availability of its reources, might reorient some of its existing programs to acquire the needed hydrographic and/or meteorological data now obtained from the Coast Guard, it seems unlikely that the National Weather Service could acquire needed meteorological observations from marine areas or disseminate marine weather information with its existing facilities. The result would be possible

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further degradation of weather services from an agency whose program has also been adversely affected by nearly level funding in recent years and by current budget reductions.

In 1970, when the National Data Buoy Development Project was transferred from the Coast Guard to the newly formed NOAA, it was agreed that the Coast Guard would continue to provide cutter services for deployment and servicing of the data buoys and a cadre of Coast Guard officers, on a cost-reimbursable basis, to the NOAA Data Buoy Office, since NOAA had neither the proper ship support nor the trained personnel for these services. Transfer of these service responsibilities completely to NOAA would not reduce costs to the Government of the data buoy project, since NOAA, also under tight budget restrictions, would then be required to acquire the services elsewhere, presumably by contract, at a cost much higher than that now met by the Coast Guard.

PART IV.—CROSS-PROGRAM PLANNING

COAST GUARD MANPOWER PLANNING AND MANAGEMENT*

Current Status of Coast Guard Manpower

RECRUITING

The Coast Guard has had little problem in securing adequate numbers of recruits to sustain its authorized force levels of approximately 40,000 active duty personnel.[1] Active Coast Guard recruiters have waiting lists of prospective recruits.[2] The Coast Guard Selected Reserve is in a similar situation; it faces the prospect of having to turn away recruits due to lack of funding for authorized strengths higher than the current level of 11,700.[3] The Individual Ready Reserve [IRR] of the Coast Guard has approximately 8,600 personnel, about 2,000 below current mobilization requirements (assuming a 100 percent availability of IRR personnel upon actual mobilization, which is highly unlikely).[4] There is also a volunteer Coast Guard Auxiliary of 44,000 unpaid civilians, who do not have formal military status.

In gross terms, therefore, the Coast Guard appears to be capable of meeting currently authorized strength goals.

When measured against Coast Guard-determined manpower needs, however (which this report neither accepts nor rejects), both actual and authorized strengths are inadequate. For example, the Coast Guard believes that approximately 22,000 Reserve personnel are required to augment the current active Coast Guard in time of war within 30 days of mobilization (M+30). Based on realistic personnel availability rates, the Coast Guard believes that a Selected Reserve of 15,500 and an IRR of 13,000 are required to supply these 22,000 personnel by M+30, as opposed to current strengths of 11,700 and 8,500 respectively.[5]

Reserve manpower requirements however, are based in large part on the numbers of Reserves which are required to "flesh out" an Active Force of given size in time of war. They do not necessarily address the adequacy of Active Force requirements themselves.

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* Prepared by Robert L. Goldich, specialist in national defense, Foreign Affairs and National Defense Division.

[1] U.S. Congress. House. Committee on Merchant Marine and Fisheries. "Coast Guard Authorization, Reserve, and Oversight." Hearings, 96th Congress, 2d session. Washington, U.S. Government Printing Office, 1980, 17.

[2] Ibid.

[3] U.S. Congress. House. Committee on Armed Services. "Military Posture and H.R. 6945 [H.R. 6974], Department of Defense Authorization for Appropriations for Fiscal Year 1981." Part 5 of 6 parts, military personnel. Hearings, 96th Congress, 2d session. Washington, U.S. Government Printing Office, 1980, 658.

[4] Ibid., 661.

[5] "U.S. Coast Guard Military Personnel Requirements." Report to the Department of Transportation and the Office of Management and Budget. October 1980, VI-53/54.

In late 1980 the Coast Guard at the direction of OST/OMB conducted a "Zero-Based Personnel Requirements Study," which identified three levels of Coast Guard active manpower. The first level was actual fiscal year 1979 strength of approximately 39,000 active duty personnel; it was found to be sustainable only in the short term, but remaining at this level would result in "gradual exhaustion of capital and/or personnel resources to the point of functional impairment."[6] The second level would continue current Coast Guard operations, but with an increment of manpower which would enable current operations to continue without exhausting capital, equipment, and personnel. This level was found to require 54,000 Coast Guard personnel, approximately 15,000 persons and 38 percent higher than actual fiscal year 1979 levels. The third level would enable the Coast Guard to accomplish all of its missions without regard to fiscal constraints. This would require, according to the study, a 74,000-person Active Coast Guard—35,000 more people and almost 90 percent more manpower than at present.[7] The study does not indicate that increased Reserve manpower would be required to support these proposed increased Active Forces upon mobilization, however, past experience with the DOD Reserve components indicates that this might well be the case. Nor, on the other hand, are there any indications that either Reserve or Auxiliary personnel were considered as alternative providers of Coast Guard peacetime services, which could diminish active force requirements.[8]

In short, although the fiscally constrained Coast Guard of 1981 is essentially obtaining enough personnel to meet its truncated peacetime authorized strength needs, it is short of mobilization manpower. Furthermore, the ability of recruiters to respond to major increases in peacetime strengths is problematical at best, given the problems faced by all military services in the All-Volunteer Force era.

QUALITY

The Armed Forces usually evaluate measurable indices of quality as educational attainment, intelligence level as determined by a standardized aptitude test, and proportions of career personnel in the total force. Using these idices, the Coast Guard is having some quality problems, although they are not all serious.

Educational quality has remained high, with 80–85 percent of recruits being high school graduates, compared to slightly over 60 percent for the DOD services.[9] However, since fiscal year 1973, when the All-Volunteer Force began, Coast Guard recruit mental category distributions have changed as follows: [10]

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[6] Ibid., 2.
[7] Ibid., 7–8.
[8] Ibid., VI–53/54. See below, pp. 9–10.
[9] Purcell, Rosemary. "Hayes Focuses Priorities on Lifestyle and Operations." Navy Times, Feb. 23, 1981; 10.
[10] "USCG Military Personnel Requirements." Appendices. Report to the Department of Transportation and the Office of Management and Budget. October 1980: Appendix XV: Mental categories of Coast Guard recruits.

DISTRIBUTION OF RECRUITS BY MENTAL CATEGORY

Category	Fiscal year—		Change
	1973	1979	
I. (Superior)	4.3	1.2	−3.1
II. (Above average)	45.9	32.9	−13.0
III. (Average)	39.2	49.2	+10.0
IV. (Below average)	10.1	15.9	+5.8
V. (Far below average)	0.5	0.8	+0.3

There has thus been a substantial decrease of the proportion of recruits whose intelligence is above average or superior, and substantial increases in the proportion whose intelligence is average or below.

The presence of adequate numbers and proportions of experienced career personnel is another important index of personnel quality. Here the Coast Guard has experienced the same inadequate retention as the four larger military services. First-term enlisted retention was stable at 20 percent for several years, although its has risen to 25 percent recently—unlike the DOD services, where it has actually jumped from approximately 25 t 40 percent under the All-Volunteer Force—but career—second-term and later—retention has dropped from approximately 90 percent in 1972–77 to 67–70 percent in 1980, although rates have recently shown a slow increase to 73–75 percent.[11] First-term retention and dropping career retention has been to drastically decrease the experience level of the enlisted force. At the beginning of 1980, over 60 percent of Coast Guard enlisted personnel had less than 4 years of service and almost 33 percent had less than 2 years service. By mid-1981, it is estimated that approximately 50 percent will have less than 2 years service.[12] This is a proportion of inexperienced personnel much larger than that which obtains in the Army, Navy, Marine Corps, or Air Force.

Coast Guard quality problems are complicated by the uniquely varied and complex responsibilities of relatively junior enlisted personnel. Coast Guard petty officers interact with the public and with civil authorities, often without immediately available guidance from commissioned officers of any grade, far more than comparable personnel in the DOD services. Advanced technology also requires more experienced personnel: [13]

> The dual role of regulator and enforcer thrusts upon our people the necessity of being an "expert" on a myriad of regulations, while at the same instant exhibiting the maturity, tact and judgment necessary in an "enforcer." For instance, a BM2 [Boatswain's Mate 2nd Class] stationed aboard a medium endurance cutter may, in the space of one day, be called upon to play an important part in an at-sea replenishment, supervise the maintenance of his vessel, serve as a boat coxswain in a Search and Rescue case, and be the leader of an armed boarding party in a law enforcement case. The sheer volume of knowledge required of this man, from ordinary seamanship to criminal law to boating safety regulations, is staggering. If he is average, he made BM2 with 3 years, 8 months total service.

[11] Coast Guard authorization, reserve, and oversight hearings, 15; Department of Transportation. USCG fiscal year 1982 spring preview. Issue paper: "Military Retention;" Purcell, 10.
[12] Coast Guard authorization, reserve, and oversight hearings, 10–11; Coast Guard fiscal year 1982 spring reviews. Issue paper: "Military Retention," 2.
[13] Coast Guard fiscal year 1982 spring review. Issue paper: "Military Retention," 2-3.

The technological changes of the past few years need no illustration. Advanced technologies offer tremendous capabilities and have allowed the Coast Guard to perform many of its missions without expanding its personnel base commensurately. . . . However, maintenance of this higher technology equipment requires more and higher level training, which leads to more specialization. We are entering an era where the average Coast Guard member is no longer only a generalist, but both a generalist in Coast Guard missions and a specialist in several different fields.

The Coast Guard, therefore, is experiencing much the same quality and retention problems as the other four military services. The impact on the Coast Guard, however, may be even worse.

OPTIONS

The options open to the Coast Guard in order to solve its manpower problems are in general little different from those open to the other services, and to the nation as a whole. Can adequate quality and quantity of manpower be secured by a judicious use of compensation and similar incentives, or is a return to the draft necessary? While the Coast Guard has never taken draftees, it benefited from substantial numbers of draft-induced enlistments from "volunteers" who were avoiding conscription into the Army. A return to conscription (while continuing to allow persons to volunteer before their actual call for induction, as has always been the case) would presumably increase the potential manpower pool from which the Coast Guard could draw one way or another. Otherwise, there appears to be little else the Coast Guard can do to secure adequate numbers of qualified first-term enlistees other than providing whatever amounts of compensation are necessary to get enough volunteers. These options, of course, are not Coast Guard, or even general military options—they involve profound political and social decisions to be made for the country as a whole.

Enlisted retention may be another story. The overwhelming importance of adequate career force compensation in maintaining retention levels has been documented in numerous analyses since the 1940's.[14] There is no reason to believe that this is any less true for the Coast Guard career enlisted force than the DOD military services. Improvements in career retention since a low was reached in fiscal year 1979 are due apparently to both anticipation of and the

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[14] See "Career Compensation for the Uniformed Forces." A report and recommendation for the Secretary of Defense by the Advisory Commission on Service Pay (the "Hook" Commission), and appendix. Washington, U.S. Government Printing Office, December 1948; "A Modern Concept of Manpower Management and Compensation for Personnel of the Uniformed Services." Vol. I: Military personnel. "A Report and Recommendation for the Secretary of Defense" by the Defense Advisory Committee on Professional and Technical Compensation (the "Cordiner Committee" report). Washington, U.S. Government Printing Office, May 1957; Department of Defense. "Modernizing Military Pay." Report of the First Quadrennial Review of Military Compensation. Vol. I: Active duty compensation. Washington, U.S. Government Printing Office, Nov. 1. 1967.

A variety of analyses have confirmed that military compensation levels, in terms of real purchasing power, peaked in 1972-73 and have eroded steadily since then, at an accelerating rate after about 1975-76. See Office of the Deputy Assistant Secretary of Defense (Military Personnel Policy). Report of the pay adequacy study. October 1979; U.S. Congress. Senate. Committee on Armed Services. "Department of Defense Authorization for Appropriations for Fiscal Year 1980. Part 4, Manpower and Personnel." Hearings, 96th Congress, 1st session. Washington, U.S. Government Printing Office, 1979: 1970-75; Richard L. Eisenman, with Paul Zinsmeister and Robert L. Goldich. "What's Happened to Military Pay and Benefits through the Past Decade?" Report 78-9F. Washington, Library of Congress, Congressional Research Service, Dec. 30, 1977; Melvin R. Laird. "People, Not Hardware: The Highest Defense Priority." Special Analysis 80-1. Washington, American Enterprise Institute for Public Policy Research, 1980.

actual effects of major compensation legislation enacted in 1980.[15] The Coast Guard therefore will be able to take advantage of this legislation as well.

One specific aspect of Coast Guard recruiting and retention leaps out at the analyst more familiar with the DOD services—the comparatively low first-term retention rates of the Coast Guard. Coast Guard first-term retention has hovered around 20 percent since the inception of th AVF.[16] DOD first-term retention has risen steadily from 24 percent in fiscal year 1973 to 35 percent in fiscal year 1977 and reached 39 percent in fiscal year 1980. Since fiscal year 1974, Navy first-term retention—the most analogous statistic among the DOD services, albeit an imperfect one—has not fallen below 33 percent.[17] Improvement of the first-term retention, with consequent positive effects on the experience level of the enlisted force and on first-term initial recruiting requirements, would therefore appear to be a priority for the Coast Guard. Given the Coast Guard's own repeated statements about the need for maturity and experience, as well as technical skill, among its enlisted force, it is not clear why its own documents do not express more specific concern about first-term retention, or why its first-term rates are so low.[18]

A survey of Coast Guard quantitative manpower requirements indicates what may be a more fundamental problem than any discussed above. There appears to have been no integration of the active Coast Guard, Coast Guard Reserve components, and the Coast Guard Auxiliary in assessing total Coast Guard manpower requirements. The zero-based personnel requirements study completed in October 1980, for instance, provides exhaustive discussion of Coast Guard active duty military personnel requirements. But the extent to which these requirements are currently being met by the Coast Guard Selected Reserve as part of the Reserve's augmentation training, or by the Auxiliary, is not indicated. Nor are there any indications of the extent to which the higher Coast Guard manpower levels cited in the study—required to avoid plant and personnel depletion, or to fulfill more mission responsibilities—contemplate having the Active Coast Guard assume the entire increased burden. Perhaps these levels need not be as high, if the Selected Reserve or Auxiliary were to take on more responsibilities, especially in view of their conspicuous success in doing so at present. In this regard, it is interesting to note throughout the 1970's, Coast Guard active duty strength remained relatively constant at 37,000–39,000,[19] despite considerable increases in Coast Guard responsibilities. Selected Reserve strength, however, rose from 8,500 to 11,700, and it may be that this infusion of Reserve manpower (plus a radical reorientation of the Reserve's mission to support the

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[15] Public Law 96-342, Department of Defense Appropriation Authorization Act for 1981; Public Law 96-343, Military Personnel and Compensation Amendments of 1980; Public Law 96-579, Military Pay and Allowances Benefits Act of 1980.

[16] Coast Guard authorization, reserve, and oversight hearings, 15.

[17] Statistics obtained from Office of the Assistant Secretary of Defense (Comptroller). See "CRS Issue Brief 77032, Military Manpower Policy and the All-Volunteer Force," table D.

[18] See Andrew G. Welch. "Operations or Regulations?" U.S. Naval Institute proceedings, October 1980, 55, for a discussion of first-term retention.

[19] "Coast Guard Military Personnel Requirements." Appendices. "Appendix II: Coast Guard Military Personnel Requests and Results since 1970." Not all program changes were increases. During this time the ocean station program was phased out and its assets reprogramed to other activities.

active Coast Guard in peacetime) prevented an even greater gap from opening between Coast Guard missions and resources.

COAST GUARD RESERVE AND COAST GUARD MANPOWER MOBILIZATION[20]

The Coast Guard maintains both Selected Reserve and Individual Ready Reserve (IRR) components, as do the DOD military services. The Selected Reserve consists of reservists in paid status who generally perform approximately 2 weeks of annual active duty training and 1 weekend of inactive duty training ("drill") per month. Some have prior active Coast Guard experience, others are enlisted directly from civilian life without prior service and are usually required to undergo several months of initial active duty for training. Selected Reservists have the highest priority for mobilization. Their training consists of augmentation training (on-the-job training in which reservists support a mission or unit of the active Coast Guard, often completely replacing an active unit), formal training (academic instruction in both peacetime and mobilization-related skills), and unit administration. The IRR is designed to fill requirements for previously trained individual reservists to be promptly available upon mobilization. The IRR consists mostly of personnel who have served on active duty, are not members of the Selected Reserve, and who have not completed their total 6-year military obligation. They are not currently required to train periodically, although they are legally obligated to so if ordered.

The Coast Guard Reserve serves two purposes. One is its mission to provide trained units and individuals to augment the active Coast Guard upon mobilization for war; the second, informally, is to augment, by personnel on training duty, the active Coast Guard in the performance of its peacetime missions. To assist in fulfilling this latter purpose, the Coast Guard Reserve is the only Reserve of the Armed Forces (as distinct from the National Guard operating as the militia of the several States) whose personnel can be involuntarily ordered to active duty to assist in domestic emergencies (14 U.S.C. 764).

Although there is nominally no conflict, this dual purpose of the Coast Guard Reserve has led to certain practical problems. Perhaps the central one is how to insure the wartime mission takes priority in planning and structuring the Reserve. The amount of augmentation training performed by the Reserve is so substantial that the Reserve is not just a mobilization resource, but an essential part of the active Coast Guard in peacetime. Reservists are "part-time active Coast Guardsmen."[21] Given their usefulness in helping a hard-pressed active Coast Guard perform its peacetime missions, there is a great pressure to orient the Reserve toward skills which assist the Coast Guard in peace rather than war. On the other hand, too much orientation toward peacetime augmentation can

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[20] There is an operating program plan for the Coast Guard Reserve. However, that plan was not reviewed in chapter III as a separate program because this study considered the Reserve as an integral part of Coast Guard manpower. This section of our report examined the operating program plan for the Coast Guard Reserve.

[21] U.S. Congress. House. Committee on Armed Services. "Military Posture and H.R. 6495" [H.R. 6974], Department of Defense authorization for appropriations for fiscal year 1981. Hearings, 96th Congress, 2d session. Part 5 of 6 parts, "Military Personnel." Washington, U.S. Government Printing Office, 1980, 658–61; ". . . the Desperate Straits We're In." An interview with Adm. John B. Hayes, U.S. Coast Guard. U.S. Naval Institute proceedings, October 1980, 22.

cause mobilization skills to lapse. When the Reserve does mobilize, it might then be found wanting because of excessive concentration on peacetime skills. As the Coast Guard Reserve is currently the only Armed Forces component, active, or reserve, which is specifically charged with port security in wartime,[22] the issue of peacetime versus wartime training is especially important in this area. Some analysts believe that the precise skills required for both peacetime operations and wartime port security missions—small craft operations, work in harbors, monitoring and control of shipping—are similar, and that the issue of conflict is overdrawn. Others feel that familiarity with particular ports and knowledge of wartime procedures is as important as discrete mechanical and administrative task performance.

Another issue relating to dual mission status involves the changing roles and missions of the Coast Guard generally. The Coast Guard Reserve currently possesses personnel with enough expertise and training to enable it to perform Active Coast Guard tasks such as boating safety and routine environmental monitoring. To the extent that the Coast Guard "works itself out" of missions such as these,[23] so as to free its resources for more complex and demanding missions, will the Reserve be able to continue assuming its share of the total peacetime Coast Guard workload? Are the reservists capable of handling small craft and participating in boating safety operations likely to be able to participate in control and protection of offshore mineral resources and counter drug traffic? If not, will the Reserve have to undergo more formal training, diminishing its actual ability to augment the Coast Guard in peacetime?

The uncertaintly and ambiguity about Coast Guard Reserve roles and missions, and the ability of the Reserve to carry them out in the future, is mirrored by the lack of systematic Reserve manpower and mobilization planning. Reserve mobilization plans have not been updated since 1976. The October 1980 zero-based personnel requirements study of the Coast Guard, which analyzed active duty personnel requirements exhaustively, did not address the issue of Reserve personnel requirements at all. Instead, it accepted without comment current requirements.[24] In particular, it is not clear how many of its domestic responsibilities the Coast Guard plans to shed upon mobilization, and what preparations have been made for other agencies to take up the slack. Some—such as boating safety and environmental protection—may be drastically diminished in time of war. Others are required in both peace and war, and some—port safety and security and search and rescue—expand enormously upon mobilization. Also, the ability of the Coast Guard—Active and Reserve—to make effective use of the Coast Guard Auxiliary in time of war is not clear. Until recently, sufficient resources were not assigned to mobilization planning efforts,

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[22] "U.S. Coast Guard Military Personnel Requirements." Report to the Department of Transportation and the Office of Management and Budget. October 1980, VI-53.

[23] See Hayes inteview, "* * * the Desperate Straits We're In," p. 18, for some discussion of this.

[24] Compare the Coast Guard Reserve manower requirements described in the fiscal year 1981 House Armed Services Committee hearings cited in note 1, above (before the completion of the zero-based personnel requirements study) with those on pp. VI-53/54 of the study.

so there has been little ability to plan for the comprehensive use of all available assets upon mobilization.[25]

The ability of the Coast Guard Reserve to mobilize its personnel quickly and effectively per se is unquestioned. Mobilizations for domestic emergencies have been prompt and had a very high response rate.[26] The enthusiasms and current experience level of reservists appears to be high. The emerging issue for Coast Guard Reserve and mobilization planning, as with the rest of the Coast Guard, is not the individual performance of discrete missions, but the adequacy and appropriateness of overall planning at higher echelons.

OPTIONS

How the Coast Guard plans to use its Reserve in the future depends in large part on how it—and its clients and interest groups—view the entire institution. To what extent is the Coast Guard viewed as a peacetime force with police and constabulary responsibilities, and to what extent is it an armed force essential for mobilization in time of major war? The Coast Guard, as well as the DOD services and the Nation as a whole, has become increasingly cognizant of the threat of Soviet military power and general international instability which could lead to war. Even if both the Active Coast Guard and the Reserve were increased in size, it seems likely that mobilization preparedness will continue to grow as one of the Coast Guard's major preoccupations. If this is the case, the Reserve will probably shift more toward a training and preparing peacetime role, and away from the operational role that results from peacetime augmentation of Active Coast Guard operations.

The pressure for peacetime augmentation training is immense, due to the fiscally constrained resources of the Active Coast Guard. The current balance of Reserve augmentation training amd mobilization preparedness, which has served the Coast Guard well, is being overtaken by strains on the Active Coast Guard and the increasingly complex nature of Coast Guard operations.

FUTURE COAST GUARD REQUIREMENTS

Future Coast Guard manpower requirements—both qualitative and quantitative—will be affected by the extent to which (1) current Coast Guard responsibilities are increased or decreased and (2) completely new mission areas come under the Coast Guard's purview.[27]

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[25] Comments by former Coast Guard officers.

[26] Robert L. Scheina. "The Cuban Exodus of 1980." U.S. Naval Institute proceedings, October 1980, 49–50.

[27] Much material for this issue was drawn from two printed sources, which are representative of a host of similar documents not cited. One of these was a special issue of the U.S. Naval Institute proceedings devoted entirely to the Coast Guard (October 1980), containing articles on the Coast Guard role in antisubmarine warfare, general overview and policy recommendations for the Coast Guard in the 1980's, the Cuban refugee operation of 1980, the seagoing operational versus the regulatory responsibilities of the Coast Guard, law enforcement, the status of Coast Guard ships, aircraft, and other physical plant, and other issues as well. Manpower and personnel problems were woven into much of the discussion. The second is U.S. General Accounting Office, "The Coast Guard—Limited Resources Curtail Ability to Meet Responsibilities." Report Nos. B–197147 and CFD–80–76. Washington, Apr. 3, 1980.

The Coast Guard's ongoing and constant reevaluation of its proper roles and missions is and will be driven by two major factors. First, the dividing line between the Coast Guard's traditional responsibilities along the North American coastline and littoral on the one hand, and the traditional blue-water responsibilities of the Navy, Merchant Marine superviosry agencies, and international maritime organizations and regulations on the other, is becoming increasingly blurred. Second, the organization and technology required for successful and productive exploration and exploitation of the oceans and their coastlines is becoming more and more sophisticated. At the same time traditional uses of these areas at low levels of technical complexity—such as recreation—are also increasing, thus placing an enormous strain on the Coast Guard's institutional orientation.

Specifically, there is a tendency for the Coast Guard to divest itself of law enforcement, marine safety, and environmental monitoring tasks which can be handled by state and local authorities. Boating safety, routine harbor policing, and control of minor oil spills are typical examples. The demands of more pressing and rigorous missions are leading the Coast Guard to view its responsibilities in these areas as one of advice and technical assistance (especially in setting up local programs) rather then direct involvement.[28]

Simultaneously, the requirements for more sophisticated operations have increased. Protection of American interests in high-technology exploitation of ocean resources is perhaps the area with the greatest long-term growth potential. This includes deep seabed mining, offshore drilling for oil and gas, fishing in the open sea and along the continental shelf, and—in the distant future—seabed settlement and colonization to support this kind of economic activity. Dealing with high-intensity criminal activities, such as drug trafficking, terrorism for both political and pecuniary gain, and illegal immigration is a second area of increased Coast Guard responsibility. Finally, the Coast Guard sees increasing requirements for inshore warfare operations, port security, and coastal defense in the case of a major war with the Soviet Union. Protection of coastal shipping routes against Soviet submarines, defense of coastal installations and population centers against Soviet and naval bombardment—of which cruise missile attack would be a primary component—and the securing of the continental shelf waters from nuclear cruise missile-carrying submarines are all involved.

The effects of this changing orientation of the Coast Guard on its manpower policy are only beginning to become apparent. The increasing need for maturity, and experienced technical specialists is the most obvious one. An even more fundamental question involves the ability of the current Coast Guard manpower structure—training and education, career patterns, and personnel management—to support the Coast Guard as it moves into unchartered waters—literally and figuratively. For instance, one of the major thrusts of Coast Guard attempts to cope with the Soviet threat to North

[28] For a concise statement supporting this policy, see Capt. Robert G. Moore, U.S. Coast Guard, "The Coast Guard in the Eighties." U.S. Naval Institute proceedings, October 1980, 40–41, and pp. i, 37–42 of the GAO report cited above in note 1.

American ports and coastlines involves procurement of more advanced cutters and naval weapon systems and aircraft. Can the current Coast Guard education and training structure train individuals and crews for such operations? If not, then the Coast Guard will either have to expand its own basing facilities and infrastructure or rely on those of a hard-pressed Navy, a subject on which the Navy may have its own priorities. The Coast Guard will require increasing numbers of officers with backgrounds in ocean sciences, marine engineering and technology, and maritime/admiralty law—proportionally many more than the Navy. Can it secure this expertise in-house? If not, it will have to acquire the ability to do so or educate its personnel elsewhere.

Anticipated decreases in Coast Guard direct involvement in minor law enforcement and safety problems may actually diminish the requirement for Coast Guard personnel to have a "police" rather than a "military" orientation, as Coast Guard operations involve more sustained work at sea and less direct contact with the general public.[29] At the same time, the intricacies of ocean resources control and policing will involve the Coast Guard in even more areas of diplomacy and international economics.

In short, it appears that the Coast Guard is headed in the direction of becoming more of an armed force and less of a police organization, in terms of practical, day-to-day functions and contacts with the general public.[30] It also appears that its increasing responsibilities will require many more personnel. The facilities and infrastructure to support this larger and more sophisticated Coast Guard will have to be either built or borrowed from the other services, principally the Navy, involving substantial budgetary costs. Even more importantly, however, the Coast Guard will have to evolve much more complex, detailed, bureaucratic, and systematic methods for managing and controlling its personnel. Whether or not it will be able to retain much of its unique character as an armed force which is less—and therefore more—than a purely military service is very uncertain.

OPTIONS

The options relating to provision of adequate manpower for future Coast Guard roles and missions fall into two broad categories. Should the Coast Guard shift its responsibilities and burdens along the lines suggested above? If such a shift takes place, how can the Coast Guard's manpower structure cope with it?

The Coast Guard is currently a small organization which functions without an elaborate administrative and support structure which higher force levels or more complex and arduous missions would require. This includes a full panoply of self-administered individual and unit training programs and facilities, medical support,

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[29] The Coast Guard itself appears to be ambivalent at best about how much of a police and law enforcement agency it should be, both at present and for the future. See Lt. Comdr. John F. Eversole, U.S. Coast Guard, "Standing into Danger," U.S. Naval Institute proceedings, October 1980, 58–65, for a positive view, and a vehement demurrer from Lt. Comdr. Michael R. Adams, U.S. Coast Guard, "Torpedoing the Coast Guard's Good-Guy Image," U.S. Naval Institute proceedings, October 1980, 137–39.

[30] See Moore, "The Coast Guard in the Eighties," pp. 40–42 for statements of future Coast Guard roles and missions which strongly imply this.

and personnel management systems. More blue-water activity by the Coast Guard, operations related to high technology, and the personnel required to perform these functions—as identified in the October 1980 Coast Guard zero-based personnel requirements study, for example—will require quantum jumps in Coast Guard education and training efforts and the installation of systematic assignment and career development planning.

The Coast Guard should be able to do all of these things given enough money, with the possible exception of drastically increasing manpower in an All-Volunteer Force environment. If it does, however, in manpower and personnel policies as well as all other areas it will be encroaching on roles and missions hitherto performed by the Navy. Should the Coast Guard man ships, train personnel, and create an officer and NCO corps which more and more duplicate those of the Navy, especially if those ships, training facilities, and personnel are obtained in large part from the Navy? If the Coast Guard does not do those things, who will take up the slack?

MILITARY READINESS AND MOBILIZATION*

Basis for the Responsibility

One of the Coast Guard's primary responsibilities is to be prepared to serve in the Navy during wartime or periods of national emergency. This responsibility is codified in title 14, U.S. Code. Specifically, the Coast Guard "* * * shall maintain a state of readiness to function as a specialized service in the Navy in time of war." [1] The statute continues by stating that the Secretary of Transportation should insure that the Coast Guard receives sufficient resources to engage in peacetime training and planning for possible future mobilization and incorporation within the Navy.[2] Once the Coast Guard is serving under Navy direction, the Navy will use the specialized services and capabilities of the Coast Guard in the provision of a national maritime defense.[3] According to 32 U.S.C. 700.53, the Coast Guard is required to "* * * organize, train and maintain the readiness of the Coast Guard to function as a specialized service in the Navy for the performance of military duties as directed." [4] Thus, the law provides that the Coast Guard should allocate a part of its peacetime resources to military functions and that, during wartime, the Navy should recognize and utilize the Coast Guard's unique capabilities.

The Coast Guard, in its own internal assessment of its organizational objectives, has designated military readiness as one of its seven long-range objectives.[5] In fact, military readiness ranks third in the Coast Guard's seven prioirities for its long-range development. "To maintain an effective, ready-armed force, prepared for, and immediately responsive to, specific tasks in time of war or emergency." [6] Thus, in both statute and internal directive, military readiness is an important component in Coast Guard operations.

As part of the readiness effort, the Coast Guard, in cooperation with the Navy, prepares and exercises mobilization plans. Coast Guard planning for mobilization is based on wartime missions drawn from statutory responsibility and activities recently assigned to the Coast Guard by the Chief of Naval Operations. The wartime missions reflect, for the most part, the Coast Guard's unique peacetime capabilities. Those missions include:[7]

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*Prepared by John J. Stocker, analyst in national defense, Foreign Affairs and National Defense Division.

[1] Navy-Coast Guard Board, "Review of Coast Guard Wartime Tasking; a Report." Apr. 6, 1981. Washington, Department of the Navy/U.S. Coast Guard.

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] Coast Guard Headquarters. Military Readiness Division (G–OMR). Military readiness/operations program fiscal year 1983–92. Operating program plan. Washington, June 26, 1980, p. 1–3.

[6] Ibid.

[7] U.S. Coast Guard and U.S. Navy. "Review of Coast Guard Wartime Tasking; a Report." Washington, Apr. 6, 1981, p. i.

Naval control of shipping
Mine countermeasures
Inshore undersea warfare
Anti-submarine warfare
Convoy escort
*SAR/Salvage
*Surveillance and interdiction
*Harbor defense and security
*Aids to navigation
*Port safety and security
*Security of locks and dams
*Surface vessel ferry command
*Anchorage regulation
*Non-combat operations
*Intelligence
*Control of pilot qualifications

*Missions also performed in peacetime.

Although there is some historical precedent for Coast Guard performance of some of these missions, they were articulated in their present form only in April of 1981. Therefore, resources required to put these activities into operation in wartime are still being defined. The Coast Guard is attempting to establish performance standards and priority statements for each program which may be required to maintain readiness for a specific wartime mission. Those already defined, and the Coast Guard's ability to match resources to requirements are reflected in some of the operating program plans analyzed in this study. As previously noted, due to current resource constraints and possibly some lack of clearly articulated priorities, the Coast Guard is not meeting its level A performance standards in its peacetime functions. This will most likely affect the Coast Guard's wartime function as well.

Performance Standards for the Military Preparedness/ Operations Program

As was stated earlier, the Coast Guard's long-range goal is "To function as an effective, ready, armed force prepared for and immediately responsive to assigned tasks in peace, war, or national emergency." [8] The Coast Guard believes that to attain this objective requires five subobjectives. These subobjectives are: [9]

1. To review and redefine the Coast Guard's military and civil contingency plans and tasks on a continuing basis.
2. To maintain an effective force of personnel whose level of military and operational expertise will prepare them to be able to respond immediately to assigned tasks in time of peace, war or national emergency.
3. To equip Coast Guard operating facilities and personnel with combat material necessary to maintain a state of readiness in time of war, or when peacetime statutory duties require action.
4. To participate in joint operational command post, multiunit, and individual exercises.
5. To fully outfit the operating force with combat censors, weapons, ammunitions, and countermeasures commensurate with technological advance.

There are three basic methods for accomplishing the long-range objective and the accompanying subobjectives. First, there is operational readiness training, which is discussed briefly in the resources section. Second, there is a requirement to insure that Coast Guard vessels have up-to-date combat systems and that Coast Guard personnel have been trained to use those systems. The mili-

[8] Operating program plan, pp. 1-4.
[9] Ibid., pp. 1-5.

tary personnel requirements study stated that, "* * * continuing attention is needed to insure that Naval modernization programs for weapons, sensors, and command and control system have parallel implementation in the Coast Guard." [10] The study continues by arguing that current combat systems will have an impact on current peacetime operations, including law enforcement. In addition, it is anticipated that these systems will reduce personnel costs through automation and will insure accomplishment of wartime tasking. The third method of attaining the standards is to improve Coast Guard preparedness planning. Preparedness planning includes "* * * participation in joint service planning and implementation of domestic emergency and contingency operations; through the preparation and promulgation of comprehensive war plans based upon realistic assessments of capabilities and foreseeable contingencies; through continued participation in joint and 'Coast Guard only' planning exercises; and through the development of command and control policy, procedures and devices to support Coast Guard operations and Navy tasking." [11] In short, the Coast Guard will use personnel training, updating hardware, and evaluating and updating plans as the methods to achieve the program standards.

Program standards are based on the Coast Guard's statutory responsibility to maintain an armed and ready force. In addition, the program standards reflect the evolution of an increasingly closer relationship between Coast Guard and Navy planning staffs. The rationale for many of the training, hardware, and planning actions are based on the need for compatability with the Navy in wartime. First, training requirements are based on an assessment of the capabilities of each of the cutters and aircraft involved in either naval warfare missions and/or Coast Guard statutory responsibilities.[12] In addition, training exercises provide a useful way of measuring the ability to achieve desired program standards. Training exercises conducted in joint operational, command post, multiunit, and individual exercises are a means of assuring that Coast Guard units can effectively integrate into Navy units, when ordered. Second, updating hardware and combat systems is based on a continuing dialog between Navy and the Coast Guard. This dialog assesses cutters and aircraft operational capabilities in certain warfare environments and recommends potential combat systems changes. In this way, the Coast Guard and the Navy attempt to insure that cutters and aircraft are outfitted with modern, capable equipment. Third, the updating and evaluation of plans is required if the Coast Guard is expected to operate as a specialized service in the Navy. Coast Guard plans and procedures must be compatible with Navy plans and procedures.

The Coast Guard has recently created a mobilization planning structure based on the marine safety zone. Marine safety zones are geographically identical to the areas of responsibility of the 54 captains of the port and represent the lowest organizational level in

[10] Military personnel requirements, p. VI-41.
[11] Ibid.
[12] Letter from Coast Guard Headquarters to the Senate Commerce Committee of Oct. 15, 1981. This paragraph drawn from contents of letter establishing basis for program standards.

the Coast Guard mobilization planning system. The operating plans developed by marine safety zone pesonnel will define the requirements for developing port readiness and will also become the building-blocks for the Coast Guard's operating plans for the district, area, and headquarters. However, this planning effort is just getting started.

Operating units in the Coast Guard's mobilization plan will be organized and tasked as "functional force components." These force components will be integral units of personnel, cutters, boats, and aircraft which can be deployed and employed as whole units. Some examples of force components include explosives loading teams, facility security survey teams, and hazardous materials teams to name 3 of the 78 components. Reserves are assigned to 56 of the 78 components as "fillers" (personnel to round out the manning). In an emergency or mobilization, the Coast Guard could activate specific force components which could respond to the needs of the situation. During peacetime, the Coast Guard will be able to monitor the readiness of these force components by means of a readiness reporting system to determine where shortfalls in personnel and hardware exist. It is these shortfalls which the Reserves are expected to fill.

Currently the Coast Guard has approximately 34 active duty personnel and 150 reservists assigned to the mobilization planning function. These personnel are located at headquarters, the 2 area and 12 district offices and the 54 marine safety zones. At the marine safety zone level, most of the planning effort is assigned to reservists under the direction of active duty personnel. Although this represents an important training exercise for the reservists and they are likely to be highly motivated because of their prospective involvement in executing the plans, maintaining continuity in planning will always be a special concern when it is largely performed by part-time personnel.

Critics have attacked the Coast Guard standards from four directions. First, some analysts believe that the Coast Guard's requirement for cutters and aircraft should not depend on the military preparedness mission. They argue that the Coast Guard's resources are so contrained that the military preparedness mission should not be performed in peacetime. This group believes that Coast Guard present calculations regarding the optimum size of the cutter and aircraft fleet are not driven by requirements for military preparedness; therefore cutting them will not adversely affect national security. Second, there has been criticism that, despite the intentions of the standards and subobjectives, comprehensive plans have yet to be prepared. The planning functions are critical to effective employment of the Coast Guard during time of war. Also, the Coast Guard's success at achieving integration with the Navy is unlikely if plans continue to remain undefined and uncoordinated with Navy/DOD planning. Third, there has also been criticism that the Coast Guard has ignored the subject of equipment and personnel readiness in its standards for the military preparedness/operations program. The GAO has argued that the Coast Guard has difficulty performing its routine peacetime missions and duties. This difficulty is caused by too few cutters and too few people. The cutter situation is aggravated by the poor operating condition of

the cutters. The people situation is aggravated by the low retention rate.[13] When current material and personnel problems are aggravated by out-dated shipboard combat systems, the ability of the Coast Guard to perform as a maritime defense force is open to question.

Fourth, Coast Guard mobilization planning has not been integrated into the mobilization planning process of the DOD.[14] The Coast Guard's recent involvement with DOD planning has tended to occur on a case-by-case basis. For example, the Coast Guard has responded to requests for planning and crisis-response teams for the Rapid Deployment Joint Task Force and the Joint Deployment Agency. Yet, on a generalized level, Coast Guard capabilities in port security and hazardous cargo transfer have not yet been incorporated in DOD plans for a fully mobilized response to war or national emergency. Until this is done, despite the apparent logic and rationality of the currently developing Coast Guard planning system, the lack of formalized input into and feedback from the DOD system will inhibit the credibility of Coast Guard planning.[15]

The Coast Guard has responded to these charges. First, they argue that they have a statutory responsibility to be a ready and armed force.[16] As a result, they dispute the notion that the cutter and aircraft plans are not based on the military preparedness program. Second, the Coast Guard would argue that coordination with the Navy has improved dramatically with the formation of the Navy-Coast Guard Board (NAVGARD). In addition, it is clear that the Coast Guard is placing primary importance on the updating of mobilization plans. As part of this effort, the Coast Guard is attempting to ensure that it gets some input into the Joint Chiefs of Staff organization and that it participates in the DOD planning process. However, it is true that the critical function of identifying fiscal requirements for the military preparedness mission has not been assigned either to the NAVGARD Board or any other joint planning/coordination effort. Some critics believe that this failure to define the budgetary resources necessary for Coast Guard training, combat systems/platform integration, or Navy-Coast Guard planning is likely to complicate the attainment of program goals and standards in the military preparedness program.

Resources Devoted to Military Readiness

Since the Coast Guard, in its entirety, would transfer to the Secretary of the Navy and the Chief of Naval Operations during wartime, it could be argued that all existing capital plant has an impact on the military readiness function. However, certain resources are more applicable to the military mission than others and it is these resources which will receive the most consideration during peacetime readiness exercises and training. It is peacetime training and the formulation of plans that predetermine the effectiveness of an organization upon mobilization. Thus, utilization of

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[13] U.S. General Accounting Office. "The Coast Guard—Limited Resources Curtail Ability to Meet Responsibilities." CED–80–76. Washington, Apr. 3, 1980, p. 27

[14] U.S. General Accounting Office. "The Readiness of the Navy Reserve and the Coast Guard." Washington, no date, pp. 3–5.

[15] Ibid., p. 1.

[16] Wartime tasking study, p. 3.

existing resources in training exercises and the allocation of personnel to planning functions are two methods of establishing general resource allocation to the military preparedness/operations program.

It should be noted that the allocation of resources to missions is constrained by the availability of multimission hardware. Thus, this description of current allocation should not be understood to represent the Coast Guard's preferred use at optimum resource levels.

PLATFORMS

As of September 25, 1980, the Coast Guard's cutter and aircraft assets were: [17]

	Units
Vessels:	
High-endurance cutters*	18
Medium-endurance cutters*	23
Large icebreakers	6
Medium icebreakers	17
Patrol craft*	75
Buoy tenders	86
Other	17
Total vessels	242
Aircraft:	
Long-range search* (HC-130)	25
Medium-range search* (HC-131/HU-16)	28
Medium-range rescue (HH-3F)	38
Short-range rescue* (HH-52A)	80
Command craft (VC-4A/VC-11A)	2
Total aircraft	173

Those units marked with an asterisk participate in military training exercises. Partial inventory access constrains the Coast Guard's ability to schedule units for military readiness exercises when only 48 percent of the vessel assets and 77 percent of the aircraft assets can train for military functions.

In addition, age of the cutter and aircraft inventory affects the individual unit's capability to fully participate in the naval exercise. Aging equipment is more difficult to maintain and usually does not have the combat systems capable of fully interacting with naval units. The WHEC and the WMEC are the two cutter categories most heavily involved in the military readiness area. The average age of the 41 cutters in these two categories is 21 years. But this average is highly skewed since the newer ships (*Hamilton* and *Reliance* classes) have an average age of 12 years. The remaining WHEC and WMEC (14 ships in all) average 39 years. It is clear that the Coast Guard is attempting to meet current military preparedness objectives with one-third of the cutter fleet dating from World War II. However, procurement of the 270 WMEC will allow retirement of the oldest WHEC and WMEC.

On the other hand, the aviation inventory is relatively modern and improving due to the current procurement programs in the HU-25 Falcon and the SRR Dolphin. Procurement of the Falcon

[17] "Combat Fleets of the World 1980/81: Their Ships, Aircraft, and Armament." Edited by Jean Labayle Corhat. Annapolis, Md., Naval Institute Press, 1980.

will permit retirement of the HC-131, while the Dolphin is scheduled to replace the HH-52A. In the near-term, the major aging problem for the aviation assets will be the HC-130.

UNIT TRAINING

In order for units to be fully trained for national emergency or mobilization, cutter and aircraft crews need to participate in training exercises, on an individual unit basis and in conjunction with naval forces in fleet exercises. As a result, the Coast Guard plans on devoting a portion of cutter and aircraft time to the military readiness function. The following table provides Coast Guard estimates for the percentage of time engaged in military preparedness and other training by cutters and aircraft: [18]

	WHEC	WMEC	WPB	SRR	MRS	LRS
Fisheries law enforcement	39	24	5	3	7	9
General law enforcement	20	59	63	7	16	9
Search and rescue	5	7	23	20	26	29
Marine environmental protection	0	1	1	14	11	6
Military preparedness and other training	28	5	1	42	33	20
Other miscellaneous operational missions	8	4	7	14	7	27
Total	100	100	100	100	100	100

Workload data from the fiscal year 1982 budget indicates that between 48 and 50 Coast Guard vessels have been or will be engaging in refresher training or shakedown training during the period fiscal years 1980–1982. This level of effort represents 21 percent of the Coast Guard's total vessel inventory engaged in military readiness training during the course of a given year. [19]

	Workload data		
	1980 actual	1981 estimate	1982 estimate
Units trained by Coast Guard training teams	420	450	475
Vessels participating in refresher training or shakedown training	48	48	50
Ship weeks	145	145	153
Independent gunnery exercises	550	550	574
Other independent exercises	15,000	20,000	20,000
Small arms courses fired	40,000	45,000	45,000

Therefore, current military readiness training represents a significant use of Coast Guard cutter and aircraft resources. In particular, the high-endurance cutter [WHEC]/short-range and recovery (SRR) helicopter team form the backbone of the Coast Guard's peacetime military preparedness resources. As indicated above, the WHEC currently devotes about 28 percent of its time to the military preparedness mission. The nearest cutter competitor is the medium-endurance cutter [WMEC] which spends about 5 percent of

[18] U.S. Department of Transportation. U.S. Coast Guard. Fiscal year 1982 spring preview. "Captial Investment Plan Strategy." Washington, no date, p. 5.

[19] U.S. Department of Transportation. U.S. Coast Guard. Fiscal year 1982 budget estimates (submission to Congress). Washington, Jan. 15, 1981, p. OE-7.

its time in the military training area. In the aviation field, the SRR helicopter (42 percent) devotes about 9 percent more of its time in training exercises than does its nearest competitor, the medium range and search aircraft (33 percent). According to Coast Guard leadership, "* * * When we go to refresher training with the Navy, it isn't for our military readiness responsibility alone. We estimate that as much as 80 percent of the training we receive at the Navy training command is directly applicable to our peacetime functions." [20]

INDIVIDUAL AND TEAM TRAINING

In order to attain its long-range goal the Coast Guard provides operational readiness training for its personnel. This training provides the average Coast Guardsman with the basic skills necessary to accomplish the military preparedness mission during peacetime and to integrate with the Navy in wartime. Most of this training is performed during refresher training and fleet exercises with the Navy. Aviators receive their military readiness training at the Navy's Aviation Training Center in Mobile, Ala.

For most personnel, the significant military preparedness training will come on the job through exercises with naval units. In fiscal year 1981, the Coast Guard sent 48 vessels through refresher or shakedown training. These vessels used 1,015 cutter days to accomplish this training. For each of the 48 vessels, this equates to about 21 days in the year that were devoted to military readiness exercises. Of the Coast Guard's entire vessel inventory, 20 percent underwent refresher and/or shakedown training during fiscal year 1981. The Coast Guard plans, for fiscal year 1982, for 50 vessels to undergo training using 1,071 cutter days. Thus, 21 percent of the inventory will receive about 21 days of training during the year.

The Coast Guard's goal in military readiness training is to: "Train major floating units for at-sea operations at Navy underway facilities; participate in joint ASW exercises; conduct gunnery exercises; direct, evaluate, and provide operational training, including small arms; conduct command post exercises; develop training plans and standards; standardize organization material for most units over 65'; and assist precommissioning activities." [21] Currently 38 percent of this goal is achieved using an average of 1,153 personnel annually.

COMBAT SYSTEMS

An area of criticism concerning Coast Guard combat readiness has been the lack of installed modern effective shipboard combat systems.[22] For example, the 270 medium endurance cutter will be delivered to the Coast Guard without an installed sonar, ASW weapons, air search radar, or close-in weapons system [CIWS].

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[20] "The Desperate Straits We're In": An Interview with Adm. John B. Hayes, U.S. Coast Guard. In United States Naval Institute proceedings, October 1980, p. 26.

[21] "U.S. Coast Guard Military Personnel Requirements." Report to the Department of Transportation and the Office of Management and Budget. Washington, October 1980, p. VI-43.

[22] Stubbs, Bruce B. (LCDR, USCG), and Richard R. Kelly (LT, USCG). "Technology, ASW, and the Coast Guard." U.S. Naval Institute proceedings, October 1980, vol. 106, No. 10, p. 30. The Navy is responsible for supplying combat systems for installation in Coast Guard ships and aircraft.

Space and weight have been reserved on the 270 for incorporation of these systems upon mobilization. But this retrofit is expected to require a shipyard period prior to deployment of the 270's into a combat zone. The requirement for retorfitting the 270's main combat gear could be complicated by shortages in the Navy's inventory and by delays in the shipyard. The 270's will have the MK-92 Fire Control System, the 76 mm Oto Melara gun, and the ship will be compatible with the Navy's current ASW helicopter system [LAMPS]. The light airborne multipurpose system [LAMPS] will function as a standoff submarine warfare [ASW] weapons delivery system and as a forward-deployed antiair warfare and antisurface warfare sensor. The *Hamilton*-class high endurance cutters [378 WHEC] have an effective shallow-water sonar [SQS-38], two triple-tube torpedo launchers (for over-the-side launch), and can operate an HH-52A helicopter. However, the helicopter is not configured for ASW operations. In fact, the Coast Guard has testified that, "These cutters lack an 'ASW standoff prosecution capability' and a means of long-range detection." [23] Neither the 270 nor the 378 cutters has received modern antiship missiles. Thus, the Coast Guard apparently considers that its most useful cutters for military operations are currently not configured for open ocean ASW, or for modern antiship warfare.

The Coast Guard has plans to improve the shipboard combat systems on the 270 and the 378. During fiscal year 1985, it is expected that the Coast Guard will test the space and weight concept of the 270. All of the planned equipments scheduled for future retrofitting will be evaluated. These equipments include: Vulcan-Phalanx close-in weapons system [CIWS], Harpoon antiship missiles, and the SQR-19 passive towed array sonar [TACTAS]. Beginning in fiscal year 1983, the 378's will enter into a midlife modernization program. This modernization effort will include needed improvements to the platform, as well as reservation of space and weight for future retrofit of combat systems. One of the 378's will have all combat systems installed including a 76 mm gun, the MK-92 Fire Control System, and an electronics package for the LAMPS MK-1 helicopter.

Aviation assets exhibit similar deficiencies. The current new procurement programs, the Falcon and the Dolphin, are expected to provide the Coast Guard with aircraft suitable to meet the peacetime missions of medium-range search and short-range recovery. However, both aircraft are relatively light and probably could not be configured for the ASW role in a significant way. On the other hand, the HH-3F is scheduled for retirement in the mid-1980's and it is possible that the Coast Guard will select the SH-60B as its replacement. The SH-60B is the Navy's airframe choice for the LAMPS mission.

Thus, it has been reported that the Coast Guard faces a situation where current platforms and combat systems may not be adequate in a future naval warfare environment.[24] However, the Coast Guard and the Navy have recognized these deficiencies and both

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[23] U.S. Congress. Senate. Committee on Commerce, Science, and Transportation. U.S. Coast Guard authorizations. 97th Congress, 1st session. Serial No. 97-15. Washington, 1981, p. 21.

[24] Stubbs and Kelly, "Technology, ASW, and the Coast Guard," p. 31.

organizations are attempting to deal with shortcomings within fiscal and operating constraints.

COAST GUARD PERFORMANCE AS MEASURED AGAINST THEIR STANDARDS

The addendum on p. 224 identifies the goals and milestones in the operating program plan intended to achieve the objective of being a ready and armed force by fiscal year 1992.

For military preparedness program as a whole the attainment of the optimum level during peacetime will "* * * provide full support of the multimission peacetime operations of the Coast Guard as well as preparation for cutter wartime service." In the three principal areas of training, hardware, and plans, the Coast Guard has established specific criteria for achievement of the optimum (level A).[25]

1. *Training.*—Major floating units at Navy training facilities every 18 months. ASW units to participate in joint exercises every 12 months. Small arms training for required billets. Annual operational training for aviators.

2. *Hardware.*—Over the next 10 years, insure that all cutters have comparable weapons systems. At 2-year intervals, assess combat systems capabilities. Maintain state of the art in future combat systems. Ammunition for all small arms and guns.

3. *Plans.*—Review and update general war plans annually, provide a yearly exercise. Review and update contingency plans annually, providing two exercises every year.

The Coast Guard admits that they have not been able to achieve these optimum levels within the budgetary resources made available to them. The military personnel requirements study states that approximately 38 percent of the optimum training is received. The report further states:

> Some Coast Guard units will continue to be marginally ready to respond to operational emergencies or maritime taskings. Some units will undoubtedly fail to properly perform operational missions under crisis conditions because of lack of training or inadequate equipment.[26]

Table 1 outlines the number of cutters typically assigned to the military preparedness mission on any given date. Currently, the Coast Guard devotes an average of 13.9 cutters or 5.7 percent of the inventory to the military preparedness mission at any one time during the year. The current level of cutter participation in the military preparedness program, however, is at the depletion level. If the Coast Guard wanted to continue its current operational level indefinitely, apparently additional resources would have to be committed. (This is defined as level C.) At level C, 5.9 percent of the cutter assets or an average of 16.3 cutters would be assigned to predominantly military operations. Both the depletion and nondepletion levels appear to fall far short of the Coast Guard's required operating levels to insure that optimum training, hardware, and planning efforts are achieved. At the optimum, the Coast Guard would expect that 12.8 percent of its cutter assets would be engaged in military readiness exercises. This equates to a total of 49.7

[25] Military personnel requirements study, p. VI-46.
[26] Ibid., p. VI-44.

cutters on the average day. In addition, the optimum military readiness function would require one-third of the WHEC and WMEC assets to be assigned to training and exercises. Currently, the Coast Guard devotes about 10 percent of its most important military assets (WHEC/WMEC) to the readiness area. Thus, according to these figures, in the area of cutter employment, the Coast Guard is clearly falling short of its optimal program standard.

TABLE 1.—CUTTERS ASSIGNED TO MILITARY PREPAREDNESS TRAINING

	Level A	MP/OP [1]	Level C	MP/OP	Current	MP/OP
WHEC	21	9.5	24	3.6	18	2.7
WMEC	84	25.9	29	2.0	24	1.5
WPB	171	7.5	77	3.7	79	3.7
WLB	24	3.4	37	3.5	29	2.8
WLM	12	.2	20	1.2	15	.9
WLIC	17	.2	14	.2	18	.2
WLI	5	.1	14	.2	6	.1
WLR	18	.2	22	.1	18	.1
WLV	2	0	2	0	2	0
WAGO	1	.1	1	0	1	0
IB type B	8	1.3	5	0	4	0
IB type C	16	1.0	13	1.0	14	1.1
IB type E	8	.1	14	.5	15	.6
IB type P	1	.2	3	.2	2	.1
WIX	1	0	3	.1	1	.1
TOTAL	389	49.7	278	16.3	246	13.9
MP as percent of total		12.8		5.9		5.7

[1] MP/OP measurement is average calculation on the number of cutters assigned on a single mission basis.
Source: DOT. USCG. "Military Personnel Requirements." Report to the DOT and the OMB, October 1980, p. III–18.

In terms of personnel, the data suggest that the situation is very much the same. (See table 2.) Current levels and the nondepletion level (level C) do not achieve the optimum. The greatest shortages are in the assignment of cutter personnel to the military readiness area. This situation provides further evidence that the military readiness program cannot achieve level A without the additional procurement of high endurance and medium endurance cutters, which are also the most labor intensive of the cutter fleet.

TABLE 2.—OPERATIONAL PERSONNEL REQUIREMENTS

	Cutter personnel	Aviation personnel	Boat and direct personnel	Total
Level A	3,953	160	357	4,470
Level C	973	234	168	1,375
Current	751	234	168	1,153

Source: U.S. Coast Guard. Military Personnel Requirements. Report to the Department of Transportation and the Office of Management and Budget. October 1980.

What the Coast Guard Needs To Meet the Optimum

Clearly, the cutter investment plan for the Coast Guard is the most critical for the military preparedness/operations program. Specifically, the Coast Guard's plan to replace aging WHEC and

WMEC form the basis for any consideration of the Coast Guard's future capability to meet the optimal program standard. The WHEC/WMEC population provides nearly one-third of the total Coast Guard effort in the military readiness area. Under the optimal level, 71 percent of the total effort in military operations would be provided through increased levels of high endurance and medium endurance cutters.

Table 1 indicates the size of the fleet required to meet level A. Table 2 shows the disparity between the current level of personnel assigned to the military preparedness mission and the required number of personnel to achieve level A. Overall, the Coast Guard requires an additional 143 cutters to achieve level A. This number includes the additional ships needed to meet all missions, not simply the military readiness mission. Of the 143 additional ships needed, the greatest shortfall lies in the medium endurance cutter and the patrol boat; both ships have important military applications. The Coast Guard believes that 60 additional WMEC and 92 additional patrol boats are needed. These two ship programs exceed the total required for the Coast Guard. The total cutter buy envisions fewer buoy tenders and smaller icebreakers than currently exist in the Coast Guard inventory. If the additional resources were procured, the WMEC alone would increase its participation in military readiness exercises from 1.5 to 25.9 average cutters devoted to the single mission.

In the personnel area, the Coast Guard would be required to recruit and retain sufficient personnel to man the expanded fleet. At level A, the Coast Guard would need 41,474 operational personnel compared to current levels of 25,352. The level A requirement is 63 percent higher than the current level. In the military preparedness area, three times the current number of operational personnel would be assigned to the single mission.

In budgetary terms, the implications of achieving level A are enormous. By fiscal year 1991, the Coast Guard would require $8.2 billion—1982 dollars—to achieve level A over the 10-year period, 1982-91.[27] Of this total, $4.9 billion or 60 percent of total investment would be needed to procure additional and replacement cutters. The capital investment plan for fiscal year 1983 projects costs of $10.8 billion—fiscal year 1983 dollars—to achieve the optimal level by fiscal year 1992.[28] In this case, cutters would require investment of $7.3 billion or 68 percent of the total for the 10-year period, 1983-92. Finally, the capital investment plan does not state the costs of the additional personnel required to man the expanded fleet. In fact, the Coast Guard has yet to address the question of where additional manning can be acquired and/or how it is to be maintained in the future.

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[27] DOT. USCG. "Capital Investment Plan 1982-91." Washington, May 23, 1980, p. 8.
[28] DOT. USCG. "Capital Investment Plan 1983-92." Washington, January 1981, p. 17.

TABLE 3.—10-YEAR CAPITAL INVESTMENT COSTS

[In billions of dollars]

	1982	1983
Cutters	4.9	7.3
Aircraft	1.2	1.3
Boats	.1	.1
Shore facilities	1.8	2.0
Electronics	.2	.2
Total	8.2	10.8

Note: Totals may not add due to rounding. 1982 data from the fiscal year 1982 Capital Investment Plan with target achieved in fiscal year 1991. 1983 data from fiscal year 1983 Capital Investment Plan with target achieved in fiscal year 1992. Some minor changes have occurred from cutter procurement plan identified in table 1. Table 3 is not precisely indicative of cost to provide fleet identified in table 1.

It is fairly clear that the Coast Guard considers the future procurement of cutters as a vital part of its contribution to the national security. The cutter employment data provided earlier suggests that the Coast Guard is falling far short of its goals in the military preparedness mission. If cutter employment does not meet goals, then it is likely that the Coast Guard's ability to meet optimal levels in training cannot be met because of the press of other mission responsibilities. With insufficient cutter levels, the number of available combat systems will also be insufficient. Without the platform, there cannot be the proper Coast Guard contribution of ASW weapons and sensors to the defense of the convoy or to the defense of the coastal waters of the United States. Only in the area of plans can the Coast Guard expect to meet its optimal expectations. Through the use of reservists, the Coast Guard expects to meet its responsibilities to improve mobilization, contingency, and joint planning with the Navy.[29]

Potential Reorganization Proposals

It has been suggested that the Coast Guard could ease their current short-fall in ships, aircraft, and personnel by transferring the organization's operational functions to the DOD. Proponents of this approach would favor transferring the Coast Guard's regulatory functions to the Maritime Administration in the DOT. The remaining Coast Guard effort would transfer to DOD and report to the Secretary of the Navy. In this way, the Coast Guard could function in a like manner as the Marine Corps.

Proponents argue that the Coast Guard could benefit from the Navy's procurement and logistic support framework. The Coast Guard's requirement for cutter procurement could benefit from the Navy's shipbuilding resources and also from the Navy's considerably greater expertise in managing and auditing contractor performance. Once cutters and aircraft are procured, logistic support would be eased by Coast Guard utilization of existing Navy industrial and maintenance plant and personnel. In addition, Coast Guard personnel could benefit, to an even greater extent than is currently the case, from Navy education and training.

[29] Telephone conversation with Director, Military Readiness Branch (G–OMR), on Nov. 4, 1981.

Critics of proposed reorganization argue that the Coast Guard would gain little from such a transfer. First, the Coast Guard's small size would make it difficult for it to win the Defense Department's continuous internal battle for fiscal resources. In this case, the example of the Marine Corps' plight is instructive. The Marine Corps depends on Navy funding for provision of amphibious shipping, aircraft, and for most operations and maintenance support. The Marine Corps can budget for its Marine-peculiar equipment—tanks, tracked landing vehicles, et cetera—but in many cases the Corps must buy into current and ongoing Army programs. Thus, there is no assurance that the Coast Guard's unique requirements would find expression in the DOD budget process. Second, critics charge that transferring the Coast Guard to DOD would not make the tasks of law enforcement, fisheries protection, and/or economic zone patrol any easier to perform. In fact, it is frequently argued that the Coast Guard's presence in the DOT and the international view of it as a law enforcement agency would be seriously jeopardized by transfer to DOD. If such a transfer took place, critics charge that the Coast Guard's exercise of its functions would be seen as an escalatory response involving a defense, rather than a law enforcement agency. Critics of the proposed transfer believe that the Coast Guard represents an essentially nonescalatory response by the United States when it involves international fishing agreements and patrol of the essential economic zone, to name a few.

As of this writing, no formal reorganization proposal has been made by either the Reagan administration or the Congress. But, many discussions assessing the Coast Guard's military functions have often included the possibility of the agency's transfer to the DOD.

ADDENDUM

MP/MO Program Standard

Program: Military Preparedness/Operations.

Objective (3): To maintain an effective, ready, armed force prepared for and immediately responsive to specific tasks in time of war or emergency.

Subobjective (1): To review and redefine the Coast Guard's military and civil contingency plans and tasks on a continuing basis.

Goal	*Milestone(s)*
a. Obtain the resources required to review and revise Coast Guard readiness plans.	1. Determine the optimum frequency for reviewing and revising the Coast Guard military and civil contingency plans and tasks. 2. Review and revise Coast Guard capabilities plans, contingency plans, LSMP, COOP, and disaster preparedness plans by FY+1 and annually thereafter. 3. Review all area and district readiness plans for continuity and consistency with G–OMR plans by FY+2 and annually thereafter.
b. Develop and rewrite Coast Guard readiness plans every 4 years.	1. Rewrite the capabilities plans by FY+0 and then at 4-year intervals. 2. Rewrite the LSMP by FY+1 and then at 4-year intervals. 3. Rewrite the COOP by FY+1 and then at 4-year intervals. 4. Rewrite the disaster plans by FY+2 and then at 4-year intervals. 5. Rewrite the contingency plans by FY+3 and then at 4-year intervals.
c. Obtain the resources required to review and revise the Coast Guard crisis staffing procedures.	1. Revise staffing procedures on an annual basis or as appropriate. 2. Develop contingency staffing procedures for antiterrorism by FY+5.
d. Maintain a reference material file of readiness related material that provides for rapid data retrieval and updating, and is 100 percent accountable for classifed material.	1. Revise and approve classified material accountability system semiannually. 2. Improve procedures for updating and retrieval of reference material.

Subobjective (2): To maintain an effective force of personnel whose level of military and operational expertise will prepare them to be able to respond immediately to assigned tasks in time of peace, war, or national emergency.

Goal	*Milestone(s)*
a. Plan for, and provide the resources to optimally utilize the following types of operational training.	1. Determine, for the various classes of ships, the optimum participation frequencies for the various types of operational training. 2. All vessels conducting independent ship's and multiship drills and exercises as per CG–415–6. 3. WHEC's, WMEC's and WAGB's attending refresher training at predetermined frequencies. 4. WHEC–378's and WMEC–270's participating in joint naval exercises at predetermined frequencies. 5. All vessels participating in STD and visiting training team programs at predetermined frequencies. 6. All vessels participating in applicable shore-based training programs at the predetermined frequencies.
b. Plan for and provide the resources to develop a readiness/training data base to be used in future cost/benefit analysis of training programs and current readiness levels.	1. Determine the requirements for a readiness/training data base. 2. Identify data base elements and develop a methodology for cost/benefit analysis.
c. Plan for and provide the resources to conduct small arms training.	1. Determine the Coast Guard job category priorities and the optimal training frequencies for small arms training within the Coast Guard. 2. Conduct small arms training as per frequency and priorities established by Milestone 1.
d. Plan for and provide the resources to support precommissioning activities for vessels.	1. WMEC–270 class precommissioning cycle completion. 2. WBAL icebreaker precommissioning cycle completion.
e. Plan for and provide the resources to develop, evaluate and revise training plans and standards.	1. Establish liaison with academic and technological communities, and other agencies, to develop more efficient and effective training materials and techniques. 2. Review and revise the readiness training plan (RTP) by FY+1 and then at 3-year intervals. 3. Review and revise the CG–415 series by FY+0 and then at 2-year intervals. 4. Review and revise the CG–465 series by FY–0 and then at 3 [illegible]ar intervals. 5. Review and revise CG–[illegible]59, CG–385, and CG–414 by FY+2 and then at 3-year intervals.
f. Plan for and provide the resources to evaluate and revise Coast Guard organizational and doctrinal documentation.	1. Review and revise the CG–260 series by FY+0 and then at 4-year intervals. 2. Review and revise the Battle Organizational Manuals by FY+1 and then at 4-year intervals. 3. Review and revise the CG–181 and CG–519 doctrines by FY+1 and then at 2-year intervals.
g. Plan for and provide the resources to improve techniques for identifying Reserve Force general MP training requirements.	1. Review and recommend revisions to Reserve training requirements by FY+1 and then at 1-year intervals. 2. Revise and revalidate Reserve mobilization plans and planning factors by FY+3 and then at 2-year intervals.

Subobjective (3): To equip Coast Guard operating facilities and personnel with combat material necessary to maintain a state of readiness in time of war, or when peacetime statutory duties require action.

Goal	*Milestones*
a. Review and revalidate of the required operational capabilities of all platforms (ROC).	1. Review and revise the ROC, by FY+1 and then at 2-year intervals.
b. Review of platform combat systems capabilities to insure applicability to military tasking assignments and other Coast Guard missions.	1. Review operational platform combat systems capabilities to insure military tasking applicability by FY+1 and then at 2-year intervals 2. Assess equipment applicability to Coast Guard missions by FY+1 and then at 2-year intervals.
c. Plan and develop an improved method for acquisition and installation of combat systems, currently maintained in Navy inventory, which will increase Coast Guard capabilities to readily integrate with the Navy in time of national emergency.	1. Establish and maintain liaison with the Navy to identify military systems, currently in the Navy inventory, that are applicable for Coast Guard utilization. 2. Develop a plan by FY+1 for acquisition and installation of Navy systems that have been identified as appropriate for installation on Coast Guard units.
d. Identity support requirements necessary to maintain the increasingly sophisticated types of Navy-owned equipment installed on Coast Guard operational units.	1. Identify and monitor support requirements for Navy-owned equipment on Coast Guard units by FY−1.
e. Review and develop tactical doctrines and publications to insure effective employment of operational systems.	1. Review and revalidate all tactical Coast Guard doctrines by FY+1 and at 2-year intervals thereafter. 2. Review Coast Guard military tasking requirements by FY+2 to identify deficiency areas requiring the future development of tactical doctrines. 3. Develop tactical doctrines for these deficiency areas identified by Milestone 2 by FY+4. 4. Review and update CG–272 including management of small arms annually.

Subobjective (4): To participate in joint operational, command post, multiunit, and individual exercises.

Goal	*Milestone(s)*
a. Plan for and provide the necessary resources to evaluate the effectiveness of existing Coast Guard contingency, continuity, and capabilities plans through joint operational and command post exercises.	1. Determine the optimal frequency of participation in joint operational and command post exercises for all Coast Guard staffs by FY−1. 2. Conduct operational and command post exercises at the predetermined frequencies.
b. Plan for and provide the necessary resources to evaluate the effectiveness of operational training programs and unit proficiency through refresher training, multiunit, and individual ship exercises.	1. Develop evaluation criteria for assessing performance of Coast Guard vessels in military preparedness and other mission areas such as ELT by FY+2 and then annually.

Goal	*Milestone(s)*
c. Improve readiness reporting and command and control.	1. Develop WWMCS applications and indoctrinate supporting commands through liaison with OP-64 and area staffs by FY+2. 2. Review and promulgate the Coast Guard Forstat reporting guide by FY+1 and then at 2-year intervals.

Subobjective (5): To fully outfit the operating force with combat sensors, weapons, ammunitions, and countermeasures commensurate with technological advances.

Goal	*Milestone(s)*
a. Establish and maintain liaison with agencies and organizations investigating and developing requirements for future operational systems based on technological advances.	1. Identify appropriate agencies and activities that are investigating and developing future combat systems applicable for Coast Guard use by FY+1. 2. Establish liaison by FY+2.
b. Plan and coordinate future acquisition, integration, and installation of applicable R. & D. stage combat systems/equipments.	1. Develop a methodology by FY+2 to identify military systems, currently in the development cycle, that may be applicable for Coast Guard utilization. 2. Develop a plan for acquisition and installation of R. & D. stage combat systems/equipment by FY+3.

Source: Coast Guard Headquarters. Military Readiness Division (G–OMR). Military readiness/operations program fiscal year 1983–92. Operating program plan. Washington, June 26, 1980, pp. 5–2 to 5–13.

CAPITAL INVESTMENT PLANNING*

The Coast Guard prepares annually a capital investment plan with a 10-year planning horizon. As previously described in chapter II, the plan summarizes and reconciles individual facilities plans for boats, cutters, aircraft, and shore facilities which are also prepared annually with the same 10-year horizon. A fundamental premise in the capital investment plan—and in the facilities plans it summarizes—is that the Coast Guard will "get well" during the 10-years of the plan. That is, during the 10 years in question, procurements and other facilities expansions, replacements, or improvements will be funded, although those funded in the final years of the plan may not be completed or delivered until later because of the long lead times involved—in ship building, for example. Reconciling the individual facilities plans is important. Shore maintenance capabilities, for example, must be sized to accommodate the projected growth in ship, aircraft, and boat inventories while reducing the significant maintenance backlog that already exists.

The military personnel requirements study group reviewed the cutter and aviation facilities plans in 1980 and judged that the methodologies employed in evolving the plans is sound.[1] The study group found a number of inconsistencies in the data inputs to both plans which they resolved to their own satisfaction for use in their report. Their corrections were substantially incorporated in more recent facilities plans. To the extent that the assumptions and planning factors employed in making the facilities plans are valid, these plans portray the Coast Guard's needs for capital investment appropriations to get well over varying periods of time as follows: [2]

Annual A.C. & I. appropriation [1] (in millions of 1983 dollars)	Years at this appropriation level	Year level A achieved
1,200	7	1993
1,079	10	1995
800	16	2001
600	31	2016
400	INF	Never

[1] The President's original fiscal year 1982 budget request of $375 million for A.C. & I. appropriations was reduced to $330 million by his October 1981 budget amendment. Although action on the request was incomplete at the time our report was prepared in December 1981, the Congress in an unusual action appropriated $300 million for Coast Guard A.C. & I. as part of the fiscal year 1982 DOD appropriations bill.

Some uncertainties concerning the assumptions and planning factors employed in making the facilities plans do exist, however.

*Prepared by Alva Bowen, specialist in national defense, Foreign Affairs and National Defense Division.

[1] "U.S. Coast Guard military personnel requirements, October 1980": Appendix VIII.

[2] U.S. Coast Guard. "Capital Investment Plan 1983-92," dated January 1981, p. 7.

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Cutter days, and boat and aircrafit hours used in the facilities plans are taken directly from the operating program plans reviewed in chapter III of this report. These data are requirements to meet level A performance standards, some of which have been challenged as unrealistically high.

The judgment of the program director as to the most appropriate platform to meet his needs was apparently accepted without challenge in drawing up the facilities plans. Some tradeoffs toward less costly platforms might have been acceptable had these challenges been made.

The plans are based on the Coast Guard's current missions and practices, modified to reflect technological progress in some cases, but without regard to possibly desirable changes in missions or practices (some of which are noted in our discussion of the operating program plans) or imposed by some dramatic occurence which could change the projections on which the program plans are based. (For example, an economic downturn could reduce or eliminate the growth in the boating public or a major pollution incident could stimulate public outcry for more environmental control effort.)

Although these uncertainties may apply to the capital investment plan—and the facilities plans—when examined by an outsider, they are not necessarily appropriate reasons for modifying the plans themselves. The plans are internal Coast Guard documents intended to rationalize in-house planning. Coast Guard leadership must make assumptions and devise planning factors to facilitate consistency in planning by subordinates. Our examination of their plans shows a high degree of internal consistency has been achieved. Their methodology seems sound, and there is reason to believe revised plans based on different planning factors and different assumptions would be similarly consistent. It is our judgment that Coast Guard capital investment planning is responsive to the leadership and its output supports their stated objectives.

Moreover, individual operating program plans provide criteria and milestones to achieve various performance levels less than level A, together with estimates of resources required to achieve them. Therefore, the basis exists for Coast Guard leadership to vary the performance goals from program to program as desired, or as deemed necessary to live within reduced budgets, and the investment planning process would reflect these judgments.

THE LINKAGE BETWEEN OPERATIONAL READINESS AND INVESTMENT

The fundamental resources allocation decision facing the policymaker for most enterprises, public or private, is between capital investment and current operations. The well run organization provides its personnel the facilities and tools they need for efficient performance. The Coast Guard has not been able to make the necessary capital investment to provide these facilities and tools for the new tasks its personnel are expected to perform or even to replace or recondition old and worn out equipment on a schedule appropriate to the needs of the agency. This conclusion is well documented, among other places, in two issue papers: Operating Facility Readiness, and Capital Investment Plan Strategy prepared by

the Coast Guard for the spring preview of the fiscal year 1982 budget.[3]

A budget decision to slight investment in favor of operations for any given year can usually be defended on grounds that putting off replacement of old equipment for 1 more year is acceptable while curtailing operations has an immediate adverse—and unacceptable—impact. But aging equipment exacts more maintenance time for every hour of use. When replacement is delayed for several years, maintenance costs, in money and in man-hours, rise significantly and this consumes even more operations resources, further reducing funds available for investment. When this pattern is aggravated, as in the case of the Coast Guard, by an increased demand for services which forces harder use of the capital plant, operational readiness eventually declines. The end result is old equipment that won't work and mission failures. According to the Commandant, the Coast Gard is facing that situation now, after a number of years of inadequate capital investment.[4]

THE BIAS IN FAVOR OF THE OPERATING EXPENSE ACCOUNT

Although the size of the problem is open to some debate, there is agreement that the Coast Guard capital plant needs a major infusion of new investment. There is no assurance, however, if the needed capital investment is made now, that misallocation similar to that which led to the current crisis will not reoccur. According to Coast Guard leadership, the reason is a procedural bias in favor of funding the operating expense account.

The Vice Commandant, Vice Admiral Scarborough testified before the Senate Committee on Commerce, Science, and Transportation, "the OE budget is essentially an incremental budget, the base of which does not really have to be justified every year; whereas, the A.C. & I. budget is truly a zero-based budget where we start in every year and ask for exactly what we are going to buy that year." [5] This leaves the A.C. & I. request liable to radical revision while the OE account receives only marginal change. For example, concerning the fiscal year 1982 Coast Guard budget, the Vice Commandant testified that, while the A.C. & I. request by the Coast Guard was reduced by the DOT and OMB from $887 million to $375 million (57.7 percent), the OE request was only reduced from $1,518 million to $1,402 million (7.6 percent).[6]

Although the fiscal year 1982 budget example demonstrates a case where Coast Guard requests were cut by external budget reviewers, the A.C. & I. request is not immune from similar treatment within the Coast Guard, as has occurred in the past. A zero based account, particularly one consisting of big dollar items, soon becomes a favorite account for making final adjustments to meet overall budget targets. Under these circumstances, the most care-

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[3] Department of Transportation, Coast Guard spring preview. No date.

[4] U.S. Congress. House. Committee on Merchant Marine and Fisheries. Subcommittee on Coast Guard and Navigation. Hearings on Coast Guard authorization, fiscal year 1982 (H.R. 2559) and oversight. Serial No. 97-2. 97th Congress, 1st session. Washington, U.S. Government Printing Office, 1981, pp. 404-405.

[5] U.S. Congress. Senate. Committee on Commerce, Science, and Transportation. Hearings on U.S. Coast Guard authorizations. 97th Congress, 1st session. Serial No. 97-15. Washington, U.S. Government Printing Office, 1981, p. 5.

[6] Ibid., pp. 4-5.

fully detailed and integrated planning is rendered ineffective by the budgeteer's red pencil.[7]

There is no reason why the A.C. & I. appropriation must remain zero based. The Coast Guard capital investment plan for fiscal year 1983 contains a calculation of the level of investment needed to provide timely replacements for the existing capital assets without any expansion or reduction in size of the capital plant. If this level of investment could be validated and accepted by all the participants in setting Coast Guard appropriation levels, a base would have been established, and a continuing basis would exist for fine-tuning the capital investment-operating expense ratio. This would improve the balance between operations and investment in Coast Guard fiscal planning, but would not resolve the underlying issue—what level of performance should be funded? The next section of the report addresses that issue.

[7] There is some evidence to indicate that the bias in favor of the operating expense appropriation is more than procedural. The individual program plans, which are the building blocks of the resource allocation process, specify their requirements in terms of man-hours and platform time (for example, boat and aircraft hours, cutter days) without distinction as to age or condition of the platform. Individual program managers compete for operating expense dollars, not A.C. & I. dollars. There is pressure to keep all the platforms and all the people working all the time. Proposals to reduce the current inventory of capital assets or people to save on operating expenses would encounter resistance at the program manager level. Since money reallocated from operating expenses to A.C. & I. would not necessarily survive the Department of Transportation and OMB reviews, this resistance may extend to higher levels.

PART V.—POLICY ISSUES FOR THE CONGRESS

In summarizing the results of our study it is useful to consider the Coast Guard as having three roles: A marine constabulary force, a maritime service and support agency and a wartime augmentation for the Navy. Reference to the historical overview presented in part I shows each of these roles has a long historical basis and we believe they will continue into the future. But as circumstances change over time, the operating programs that comprise the Coast Guard's implementation of these roles can be expected to vary. Today's operating programs can be attributed to the three basic roles as follows:[1]

Marine constabulary force

Port and environmental safety.
Enforcement of laws and treaties.

Maritime services and support agency

Service

Short range and radio navigation aids.
Polar and domestic ice operations.
Marine environmental response.
Search and rescue.
Marine science activities.

Support

Commercial vessel safety.
Recreational boating safety.
Bridge administration.
Waterways management.

Wartime augmentation for the Navy

Port and environmental safety.
Enforcement of laws and treaties.
Operational readiness/military preparedness.
Reserve forces.

The sections that follow identify policy issues for the Congress within the frame of reference established by these basic roles and their associated operating programs.

MARINE CONSTABULARY FORCE

Major responsibilities have been added to this role in recent years. The 200-mile fisheries conservation zone concept nominally

[1] Assignment of operating programs to major roles is to some extent arbitrary. Not all the activities encompassed in a particular operating program fit neatly within a single role. However, the main thrust of the operating programs contribute to the fulfillment of the role listed.

adds many thousand square miles to the ocean frontier to be policed. Fisheries protection, marine environmental protection, drug interdiction, and enforcement of immigration laws appear to present claims for more sea and air platforms hours than was the case a few years ago. Coast Guard leadership makes the point that increased demands for these functions, to an undefined extent, replace demands for similar resources formerly applied to the ocean station program and Vietnamese deployments which were phased out during the time these new requirements were developing. But in the meantime, the ships and aircraft have been retired and the personnel reprogrammed into regulatory duties required as part of the support and services agency role. The mismatch of ends and means for the marine constabulary force role has been defined by the Coast Guard but not fully accepted by either the DOT/OMB reviewers of the Coast Guard budget request or the Congress as a whole. At issue is the size of the marine constabulary force to be maintained in peacetime, and for what purposes, since the present employment of these assets is toward relatively recent, and still emerging goals. In this regard, the impact of recent change in the Posse Comitatus Act, now permitting U.S. Navy assistance in civil law enforcement, must be assessed in terms of relieving or supplementing normal Coast Guard duties or expanding their capabilities. How long will the new emphasis on illegal drug and immigrant interdiction continue? What will be the steady-state pattern of fisheries protection operations or environmental protection surveillance operations? What will offshore marine terminals add to the Coast Guard's responsibilities?

Acquisition of ships and aircraft to expand the capability of the marine constabulary force would take several years, particularly since all agree there is a backlog of needed ship replacements that will have to be overcome as well. Therefore final determiniation of force level objectives need not be made at this time, if agreement is achieved that some expansion is needed and a start is made toward acquiring the additional platforms. But this agreement has not yet been achieved among all principals.

MARITIME SERVICES AND SUPPORT

Most of the activities under this role of the Coast Guard have been going on to some degree for a long time. Active vessel traffic management and marine environmental response are relatively new. According to Coast Guard leadership, regulatory duties under the operating programs contributing to maritime support have absorbed the personnel assets formerly assigned to ships and aircraft no longer in the Coast Guard fleet—and prompted redesignation of many billets from enlisted to officer grades. Inadequate authorized numbers of personnel and insufficient platforms are blamed for excessive working hours for those assigned to perform the search and rescue function. At issue are the balance between operational and regulatory responsibilities of the agency, and whether personnel trained in operational and, particularly, military duties are being well utilized when assigned to regulatory duties. The size of the Coast Guard's operating fleet of boats, ships, and aircraft finally agreed upon, which will have a large bearing on the outcome of

these issues, depends to a large extent on the eventual size of the marine constabulary force needed in peacetime, discussed in the preceding section. There are also questions about the extent of maritime services to be provided and who should provide them. Although there are probably irreducible minimums, most of these services are nominally discretionary, and there are "how much is enough" issues associated with all of them.

WARTIME AUGMENTATION FOR THE NAVY

The U.S. Navy is sized and configured for its deepwater and overseas missions and has only limited assets that could be dedicated to inshore defensive operations such as harbor defense and security, inshore undersea warfare, mine countermeasures, coastal surveillance and interdiction, or naval control of shipping. Coast Guard assets (ships, aircraft, boats, command and control facilities, and trained people) will probably be assigned to these kinds of tasks in future wars as they have in wars past. While the Navy could acquire its own assets to perform these wartime functions, they would not be useful in meeting the Navy's peacetime tasks and would be duplicative of Coast Guard assets. Therefore the Navy does not maintain, in peacetime, the capability to conduct the kinds of wartime operations, listed above (and envisioned for the Coast Guard in the Navy-Coast Guard "Review of Wartime Tasking" report).

At the same time, it is unlikely that the Coast Guard's peacetime functions of search and rescue, enforcement of laws and treaties, icebreaking, maintenance of navigation aids, port security, et cetera would become less demanding during wartime. Search and rescue, for example, might become more difficult since there would probably be more, and more severe, incidents farther offshore than in peacetime. And in wartime the demands of port security, explosives handling and anchorage regulation take on a different and more difficult character. Therefore, provision must be made to continue much of the Coast Guard's peacetime activity during their period of wartime service with the Navy.

There are several issues over the Coast Guard's wartime role, the chief one being the extent to which prospective wartime duties should be allowed to consume resources and otherwise detract from performance of the Coast Guard's peacetime functions. Another issue is whether the Coast Guard's prospective wartime duties, particularly convoy duties which might take the ships and aircraft away from their customary coastal operating areas, will prevent performance of necessary law enforcement and maritime support and services tasks during wartime. Should the Coast Guard's peacetime force levels reflect a possible wartime need for more ships and aircraft? And should the operating characteristics of those ships and aircraft reflect the potential wartime use of the platform if that use would be substantially different from the intended peacetime employment? If the answer to these questions is yes, should the Navy or the Coast Guard pay for these extra platforms or specialized characteristics?

DEALING WITH RESOURCE CONSTRAINTS

Each of the policy questions identified in the preceding summary is rooted in the underlying issue over the affordable level of funding for the Coast Guard. Our examination of the Coast Guard's requirements setting process and the requirements it generates—the program standards and associated resource estimates—determined that the process is generally sound and effectively expresses leadership judgment of what the Coast Guard is required to do. A few of the standards and criteria developed in the process can be challenged on various grounds, as has been noted in the preceding chapters, but it is our judgment that, in the main, the Coast Guard's estimate of what they need to enable them to perform their currently assigned responsibilities, as they perceive them, has a sound analytical basis. Yet they have not been successful in increasing their share of the Federal budget to accommodate their increased responsibilities as examiniation of the action on Coast Guard budget requests for operating expenses [OE] and acquisition, construction and improvements [A.C. & I.] will show.

ACTION ON COAST GUARD BUDGET REQUEST [1]

	Fiscal Year—									
	1977		1978		1979		1980		1981	
	OE	A.C. & I.	OE	A.C. & I.	OE	A.C. & I.	OE	A.C. & I.	OE	A.C. & I.
Coast Guard request	843	300	1,003	385	1,050	406	1,094	426	1,437	735
DOT action	832	270	948	254	996	345	1,054	305	1,374	486
OMB action	843	171	920	227	981	279	1,037	284	1,340	324
Appropriated	838	236	924	256	988	287	1,403	286	1,193	334

[1] Figures show millions of current dollars.

When inflation is taken into account, the Coast Guard has, at best, received only minor real increments, for the past 5 years in these two appropriations which account for more than three-quarters of the agency's total budget. Examination of the table shows that Congress has, in general, functioned as a court of appeal between the DOT and OMB. During the 5 years displayed the appropriation exceeded the higher of the recommendations of those two reviewing offices on only one occasion (in the fiscal year 1978 A.C. & I. appropriation) and only once was it less than the lower (in the fiscal year 1981 OE appropriation).

The fiscal year 1982 experience differed from the pattern of the past 5 years in that an extra $300 million was appropriated for Coast Guard A.C. & I. in the defense appropriation bill. However, aside from this deviation, the regular Coast Guard appropriations fell within the range set by the DOT and OMB reviewing offices.[2] Even with the additional $300 million, the total appropriations for

[2] The Defense Appropriations Subcommittee added $300 million to the fiscal year 1982 Defense appropriation bill for Coast Guard A.C. & I. and these funds survived in the bill as enacted. This highly unusual action took place while the Coast Guard appropriations in the DOT appropriations bill were being settled somewhat below the Carter January 1982 budget request but considerably above the Reagan administration's amended request which reflected an economic downturn in the summer of 1981. According to Coast Guard sources, the extra $300 million has been placed in a deferred status by OMB and not been made available for Coast Guard expenditures.

fiscal year 1982 will be substantially less than the Coast Guard's original request.

While the initiative of the Armed Services Committee and Defense Appropriations Subcommittee may encourage those regularly responsible for acting on Coast Guard appropriations requests to be more forthcoming, prudence requires an examination of measures to enable the Coast Guard to operate within fiscal levels that have been in effect for the past several years. The following written exchange illustrates the problem of meeting new responsibilities in a period of fiscal austerity.

Question. I have watched with increasing alarm the growing gap between the Coast Guard's responsibilities and its ability to meet those responsibilities. How do you intend to meet these growing responsibilities?

Answer. If a request for additional resources to implement new legislative initiatives is unsuccessful, there are but two alternatives remaining:

(a) Make a priority judgment regarding the value of an ongoing mission or operation, and reprogram resources to the new task if it appears justified, thereby reducing or discontinuing some activities while assuming a new responsibility.

(b) If realigning resources is not possible, do nothing and address the new initiative within the limits of existing resource capabilities. This is the prevailing situation and forces overconsumption of the existing Coast Guard capital plant and personnel resources.[3]

Although failing in their efforts to gain increased funding to operate the agency at levels they deemed appropriate to the perceived need, the Coast Guard for a time rejected the option of doing less (a. above) and chose, instead, to overextend themselves trying to meet their obligations as they understand them. Some have criticized this decision.[4] However, Coast Guard leadership defended it on grounds "what we are doing today is either what we have been doing since World War II, to one degree or another, or it's an added task from the Congress in the form of a new law. We've not had a great deal to say about whether or not to accept or refuse new tasks. Now we are looking hard at the priorities of what we've been asked to do. For example, we have changed emphasis in our boating safety program and have reduced the total amount of dollars allocated for that function."[5]

In any complex endeavor there are probably management efficiencies that could allow more to be done for the same money. The Coast Guard is no exception to this generalization, as is indicated by several GAO reports and comments by congressional oversight committees. But the Coast Guard has been operating on restricted fiscal resources for several years. This fiscal pressure has encouraged the Coast Guard itself to seek management efficiencies, which it continues to do. Although such soul searching should be encouraged in the interest of efficient use of assigned resources, by now it seems unlikely that savings of the magnitude required to meet all goals will come from increasing Coast Guard management efficiency or discovering and correcting major waste, fraud or abuse. Reducing resource requirements to the level of recent appropriations

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[3] Question and answer for the record. U.S. Congress. Senate. Committee on Commerce, Science and Transportation. 97th Congress, 1st session. Hearings on U.S. Coast Guard authorization. Serial No. 97-15. Washington, Government Printing Office, 1981, p. 41.

[4] Webb, Andrew G. "Operations or Regulations." U.S. Naval Institute proceedings, October, 1980, p. 52.

[5] Admiral Hayes quoted in "The Desperate Straits We're In." U.S. Naval Institute proceedings, October 1980, p. 18.

requires reducing what the Coast Guard expects to do; that is, by transferring or eliminating missions, or by lowering standards.

Coast Guard leadership has apparently reached this conclusion and is beginning to implement it. According to media reports, the Coast Guard has announced plans to close numerous major activities, decommission 11 cutters, consolidate some operations and streamline others by April 1, 1982. These actions indicate, at least for the time being, that the Coast Guard is preparing to live within the means provided by the resource allocation system over the past several years. If this outcome of the issue over the Coast Guard's appropriation level is acceptable to Congress, then the urgency and intensity of issues over program priority will increase. The Congress might then find it appropriate to maintain close oversight of this competition which could pit recent legislative initiatives against the more traditional Coast Guard functions.

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